Railway Age

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Alphabetical Index to Advertisements, Page 98 Classified Directory of Advertisers, Page 93

EDITORIAL
Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

Be Sure You Are Not Too Late

The present is a buyer's market. The seller, in an effort to obtain sufficient business to keep his organization together and pay fixed charges, has established prices based on a minimum margin over the out-of-pocket cost. This is evidenced daily. Prices noted in current awards for structural steel fabricating contracts indicate the minimum spread over the cost of plain materials so characteristic of the slack season. One recent award for steel truss spans in the middle west was made at less than four cents, f. o. b. shop, while a contract for plate girders for an eastern road was taken at a little more than four cents, *erected*. The present condition of the lumber market is well known. The tie producers are also in a most receptive mood. Taking this situation as a cue a few roads are anticipating the restoration of earnings by entering the market for these products when everything is in their favor. There is, however, that weakness in human nature which leads one to expect the impossible, namely, a period of large earnings and low prices, so that many desire to see earnings definitely assured before making purchases with the idea that they will be able to get into the market just ahead of the other fellow. Unfortunately, this plan can never be a complete success. Somebody always gets left. Don't be the last man in.

Exports of Coal

In analyzing the operations of a railroad such as the Virginian or any other carrier which moves large tonnages of bituminous coal to tidewater, one is particularly struck by the great increases which have been made in the amount of coal for export. This brings out the idea that those who are interested in these roads should watch with particular interest the developments in the British coal mining situation which must be so disconcerting to our British friends. Prior to the war the larger part of those countries of the world which did not have coal of their own secured it from the United Kingdom, the British being especially fitted to supply it because of their well-organized export business and their predominance in shipping. When the war came on, the British were unable to supply their usual markets because the efforts of their merchant fleet had to be devoted to the needs of warfare and were further handicapped by German submarine activity. Since the termination of the war, another and equally serious complication has arisen in the continued labor difficulties which have cut down the supply of coal through strikes characterized by animosity and lack of patriotism such as the world has seldom seen. The result has been that British coal is now no longer available for the world in the same quantity as before the war. Those countries needing coal have had to come to America for their supply and our coal export business out of Hampton Roads, Baltimore, etc., has expanded to proportions hitherto not thought of. There is no one who will say that our export coal business is what it should be. As yet we have not the organization, nor have we gotten to the point where we have granted the desired credits. However, it seems highly probable that this export business in coal is here to stay and that we may look forward to having good and permanent markets for coal abroad, more particularly in South America, in the Mediterranean countries, etc. The result is going to be an increased demand for transportation on those coal roads which reach tide-water. In the case of the Virginian, which is referred to because so much attention is given that road in the present issue, the effect upon the growth of traffic has been particularly striking.

Freight Rates in Argentina

There has been a lot of loose talk about the danger to American producers of foreign competition in the domestic market due to high freight rates in this country and an instance of rates from inland American points to the Atlantic seaboard higher than the ocean charges for similar commodities from Argentina has been cited in high government circles. As Daniel Willard pointed out to the Senate investigating committee last week, these rates on imported commodities do not take into consideration the inland rail haul in the country of origin. It is interesting to note, therefore, in this connection, that the shippers of Argentina are complaining about the high freight rates on the railways of that country which, they say, are putting them at a disadvantage with American competition in European markets. The railways all over the world have found it necessary to increase their rates for much the same reason that rate increases have been made necessary here and the charges for rail transportation in America are still very low when compared to those of most countries. The success of American producers and of American exporters hinges on the exchange rate, which in turn resolves itself into a problem of credit extension—the present freight rates offer no serious barriers to successful competition by Americans in any market.

Reading Plan Approved

The question as to the relative rights of the common and preferred shareholders of the Reading Company as to the stock of the new corporation which is to take over the equity in the coal properties seems to be about as difficult of solution as any question that has arisen for some time. It seemed by way of solution on Saturday, when the Federal district court announced, after considerable discussion and consideration, its decision that the preferred and common shareholders should be given equal rights. On Monday morning, however, the matter was again brought to the fore when it was stated that the common shareholders would appeal to the Supreme Court with a view to continuing their fight for exclusive participation. However, the district court has apparently settled the other leading question which it had before it, namely, that relating to the disposition of the Central of New Jersey stock. The court decided that this stock should be put in the hands of trustees and held until a more suitable time for its disposition had arrived. The government attorneys desired, it will be remembered, the setting of a definite time limit on the sale of the Jersey Central stock. In view of the provisions of the Transportation Act relating to railway consolidation,

this would have been a real hardship on the Reading Company, as there could have been no sale except at a great sacrifice until the disposition of the Central of New Jersey in the consolidation plan had been finally decided upon. The court in this case has made the only proper decision as to the disposition of the Jersey Central stock and, fortunately, refused to listen to the argument of the government attorneys, who in this matter showed themselves to be without adequate comprehension of what Congress intended when it passed the Transportation Act.

Selecting Office Equipment

The efficiency of mechanical devices in railway offices is no longer a matter of doubt, provided the devices are carefully selected and properly utilized. The selection of proper equipment for any particular office, however, the care and maintenance of the devices and intelligent supervision of their use presents a problem as important and perplexing as ever. Frequently expensive mechanical equipment has been purchased without sufficient preliminary investigation to determine the kind of machines best suited to the work, the number of them required and whether the savings to be expected would justify the necessary outlay. Often, too, equipment carefully designed to effect great savings has failed to come up to expectations because of improper use and maintenance. On the Pennsylvania a method has been adopted whereby all purchases of mechanical office equipment must be passed upon by a committee of officers representing several departments. This committee has made extensive studies of the various devices on the market and, after a careful investigation of the office ordering the equipment, is able to say authoritatively whether or not the proposed purchase is justified. The work of this committee and of the office which keeps the records and oversees the repairs of all mechanical devices is described in an article by D. T. Jones, elsewhere in this issue. In view of the great savings often made possible by the careful selection and proper utilization of mechanical devices in railway offices and the possibilities of heavy losses when equipment is purchased without sufficient study, the success of the Pennsylvania in meeting the difficulties of the situation suggests the advisability of a study of this road's methods by those who are confronted with the same problem.

"It Can Be Done"

The Thirtieth Annual Session of the Freight Claim Division of the American Railway Association, which is noted elsewhere in this issue, marked the launching of an organized effort to cut in half the constant drain on revenues caused by freight claims. For some time past it has been apparent that the conditions which caused the outlay for loss and damage of freight to leap from $35,000,000 in 1917 to $51,000,000 in 1918 and $106,000,000 in 1919, and then to increase to $109,000,000 in 1920, demanded correction. It remained for the Freight Claim Division to recognize the seriousness of this situation officially, and to break precedent by setting aside a day at its annual session in which to discuss, analyze, and more important still organize for a claim prevention campaign. The movement is one which should command the interest and active support of every officer and employee on the railroads. Freight claims represent an absolute waste which can be reduced with no additional outlay for new equipment. It was established at the recent session that the success of a prevention campaign depends in considerable measure upon two factors. First, there is the necessity for closer co-operation between the carriers themselves. For instance, if the clear record which is necessary to the proper settlement of a claim is to be made, there must be more active co-operation between the carrier on whose lines the freight originates, and the road finally called upon to settle the claim. Second, much can be done to eliminate the carelessness and neglect which result in a considerable part of the loss and damage, if efforts will be made by each individual carrier to interest its employees in a prevention campaign. The results to be derived from frequent meetings of division officers and employees for discussion of the subject, to say nothing of the interest which can be aroused by a series of claim prevention bulletins posted in conspicuous places, are so decidedly worthwhile, that they can hardly be overlooked. The Freight Claim Division has chosen as its slogan "Cut Claims In Half—It Can Be Done."

Tunnel to Staten Island

The development of the Port of New York, both as to its present status and its possibilities have already been commented upon in these columns. One point outstanding so far in this work has been the understanding shown by the legislatures of New York and New Jersey of the need for better and more comprehensive rail and water terminal facilities at this port. The passing of a recent bill, mandatory in its character, concerning the construction of a tunnel across the lower bay at New York for freight and passengers between Brooklyn and Staten Island now served by ferries and car floats, is still more evidence of the desire, at least, of the New York legislature to provide increased facilities. The bill as passed is purely a mandatory one and requires that the City of New York begin construction of the tunnel mentioned above within two years, thus bringing the project off the back of the stove where it has been cooling since the administration of Mayor Mitchel. It is estimated that the work will cost at least $50,000,000 and will include facilities capable of extension or expansion to fit growing needs. Since it is desired to furnish arrangements whereby freight, in addition to passengers, may be moved from Brooklyn piers to connections with the Baltimore & Ohio on Staten Island and the Long Island and New York Connecting on Long Island, the improvement will practically unite the New England roads with those now terminating along the New Jersey waterfront. There is also present the possibility that the completion of the tunnel may bring about a more comprehensive development in this section, leading ultimately to a much greater unification in the handling of freight between the transcontinental and New England lines. In compliance with the law, preliminary work has already been started. Routes are being discussed, surveys being made and soundings taken. Several different plans will be submitted, after the surveys have been completed, probably at public hearings, and the most feasible one chosen.

A Second Lesson from Rhode Island

The Moshassuck Valley Railroad, a short line (two miles, with two locomotives) is a time-honored institution of the smallest state in the Union, but its experience affords a big lesson; big, that is, in its simplicity. It is a lesson applicable to the most extensive and important railroads of the country; and yet it is entirely free from the bewildering array of figures which the railroad executives have to use in presenting their case at Washington, and should make a convincing appeal to those citizens, congressmen and shippers who declare that they cannot see why the railroads are so sorely in need of money. A dewdrop will mirror the sun, and a two-mile railroad can illuminate financial problems measured by

billions. The Moshassuck Valley, in 1920, earned $68,026 and its expenses were $110,125. The net loss, $42,100, is chargeable mainly to the unprofitable passenger traffic; and on May 16 the Public Utilities Commission of the state authorized the entire suspension of passenger trains after the end of this month. There is a street railway near enough so that the public will not suffer much inconvenience. This decision to economize might perhaps have been taken long ago, but for feelings of sentiment; the line has been running for 44 years. Its "train" is a familiar sight, at Woodlawn, to passengers who travel frequently on day trains between Providence and Boston. The report of the hearing before the Utilities Commission indicates that it took eight persons to accomplish this simple act: the three commissioners; the controller, the clerk and the counsel of the corporation; a stenographer and a newspaper reporter. There were no remonstrants, and no spectators except the reporter.

British Railway Legislation

After long months of delay, the government, represented by Sir Eric Geddes, Minister of Transport, has introduced in the British House of Commons a bill covering the return of the railways to their owners, which is scheduled for August. This bill, which is described in greater detail elsewhere in this issue, follows in some respects our own Transportation Act, but it differs from it in many essentials. The most striking feature of the bill is the provision for consolidation of the railways into six groups, and this section, unlike our Transportation Act, is mandatory. Furthermore, these groupings are on a regional basis and do not form "independent competitive systems." The companies designated in each group are to amalgamate by January 1, 1923, unless by consent of Parliament some variations in the present grouping scheme are allowed. An "Amalgamation Tribunal" is to be constituted to adjudicate disputes arising out of the amalgamations. The Ministry of Transport and the Railway and Canal Commission are given authority to require the companies to furnish reasonable services and facilities not prejudicial to their financial well being. An elaborate commission, known as the "Railway Rates Tribunal," will be given authority over charges, which are to be fixed to allow a certain fair return to be earned by the carriers. Labor disputes are to be referred first to joint conferences in each group. Failing settlement there, a dispute may be carried to a "Central Wages Board" in which the railways and employees only are represented and, finally, to a "National Wages Board," in which the public also is to appear. The railway unions will not be represented on the boards of directors, as was expected in some quarters, but shippers are to be represented by a minority on each board. British labor is a strong factor politically in spite of the recent disagreement in the ranks, and the government's proposal will doubtless elicit strong protest from them; while the railways themselves will probably not be entirely satisfied with all the provisions of the act. Consequently, it is expected that the fate of the government's proposal will be watched with considerable interest.

The Virginian Railway

The study of the operations of a railroad of such interesting characteristics as the Virginian Railway which appears on another page of this issue should prove of particular interest at this time for a number of reasons. The Virginian uses the heaviest equipment and the most powerful locomotives in use on any railroad. It was the first road to use the 120-ton coal cars and its 2-10-10-2 Mallet locomotives of 147,200 lb. tractive effort are as yet without an equal. In 1920, the Virginian led the railroads of the country in heavy train loading. Its net tons per train averaged for the year no less than 1,800, the second carrier in the list being the Bessemer & Lake Erie, which managed to secure an average of 1,764 net tons per train. This high average on the Virginian is being brought about by the operation of trains in regular service aggregating between 8,000 and 9,000 gross tons—trains of 90 to 100 cars being hauled over some districts with a single locomotive. Further than that, in an effort to show what the real possibilities in the situation might be, on Tuesday last a test train was run consisting of 100 of the new 120-ton cars and handled by one of the huge 2-10-10-2 Mallet locomotives, which train had an aggregate gross tonnage of no less than 16,000 gross tons. The full details of how the road secures its heavy train loading and more particularly how it managed to run a train of 16,000 gross tons will be found in the article. Further than all these things, the Virginian was one of those few roads which earned in 1920 well over its standard return and guaranty; in fact, in 1920 its net railway operating income was nearly double that earned in 1919. The Virginian is a bituminous coal road almost exclusively, 92 per cent of its tonnage in 1920 being of that commodity. It was built for handling this coal as cheaply as possible, its engineering standards being such as to permit the heaviest possible train loading. The manner in which the road has realized upon the constantly expanding coal business which moves to its tidewater terminal at Hampton Roads is one of the most interesting features of American railroad operation.

The Railways and the Commission Merchants

IF THE RAILWAYS individually and collectively would make as much of a row when they are attacked as do the commission merchants who handle fruits and vegetables, those who make a business of attacking the railways would soon be so deeply buried under counter propaganda they would perish before a rescue party could dig them out. Whatever else the *Railway Age* may think of the wholesale produce merchants of the country, we bow in reverence before their propaganda department. It is one of the most active, energetic and ubiquitous organizations of its kind in existence.

In its issue for April 22, page 967, the *Railway Age* published an editorial entitled "Piratical Commission Merchants' Attacks on Freight Rates." We charged the commission merchants with carrying on a dishonest and a selfish propaganda to make the producers of fruits and vegetables believe the low prices the producers are receiving are due to the advances in freight rates, and thus to cause agitation by the producers to drive down the rates. We showed that prices being paid to producers in Texas for cabbage, white onions and spinach, plus all the transportation charges to Chicago, were only 25 per cent, 36 per cent and 10 per cent, respectively, of the prices for which these things were selling at retail in Chicago. In other words, some other person or persons besides the producers and the railroads were getting 75 per cent of the retail price of cabbage, 64 per cent of the retail price of white onions, and 90 per cent of the retail price of spinach. We charged the propaganda of the produce merchants was dishonest because the facts showed it was a gross misrepresentation to allege that the low prices the growers were receiving were due to the advances in rates. We charged it was selfish because it was being carried on by the commission merchants to increase their own profits at the expense of the railroads. We even went so far as to imply that the commission merchants bore the reputation of having been "remorseless profiteers."

Our editorial has been very widely quoted. In consequence

the *Railway Age* has been deluged with personal calls, telegrams and letters from individual commission merchants and organizations of commission merchants throughout the country who have loudly complained that we have misrepresented their practices and profits and have demanded that we retract the statements made concerning them. No retraction having been made, one of the organs of their trade, the Packer, published a garbled account of a conference between the commission merchants and the editor of this paper at Kansas City in which it falsely stated that the editor of the *Railway Age* admitted that the editorial in question, in so far as it concerned the wholesaler, was "utterly wrong."

Space will not permit us to publish all the communications we have received. In order, however, that the commission merchants may have opportunity to present their case to our readers we publish elsewhere a letter entitled "A Protest from the Commission Merchants," and signed by officers of the National League of Commission Merchants of the United States, the Western Fruit Jobbers' Association of America and the International Shippers' Association.

In three respects all the communications we have received are alike: (1) They all deny that the commission merchants are making excessive profits, and denounce the *Railway Age* for its alleged unjust attack upon them; (2) none of them denies that they and their organizations have been engaged in widespread propaganda to drive down freight rates; (3) none of them has attempted to disprove the correctness of the figures we gave regarding the prices paid to the producers, the amounts received by the railroads for transportation and refrigeration of the commodities in question, or the retail prices charged for them. We are willing to let the commission merchant and retailer fight out between them the question of who got the 64 to 90 per cent of the total retail prices of cabbage, onions and spinach which the railway and the grower did not get. Since we are giving the commission merchants space elsewhere to denounce us and tell how little money they are making, we shall confine our comments to the real subject of the editorial in our issue of April 22 to which they take exceptions.

The real subject of that editorial was the propaganda being carried on by the commission merchants against the existing freight rates. They protest violently against what they call "unjust attacks" upon their business. But what have they been doing with respect to the railroad industry? They have been persistently and completely misrepresenting the effects of the advance in rates upon fruits and vegetables. The last advance in the freight rate from Texas to Chicago on cabbage, which recently sold at retail for $140 a ton or 7 cents a pound in Chicago, was $5 a ton or 2½ mills a pound. The advance in the rate was less than 4 per cent of the retail price at which the cabbage sold. On spinach, which sold in Chicago at retail for $300 a ton, the last increase in the rate from Texas was $6 a ton. This was 3 mills a pound, or 2 per cent of the retail price. Is it not manifestly absurd to contend that an increase in freight rates amounting to 2 to 3 per cent of the retail prices of vegetables which sold at retail for $140 to $300 a ton is responsible for the fact that the grower of the vegetables received only $5 or $7 a ton for producing them? The retail price the consumer paid was large enough to have covered a reasonable profit for the retailer, a reasonable profit for the wholesale merchant, the total amount received by the railroad for transportation and, in addition, three or four times as high as a price the grower was paid. That the grower did not receive a reasonable price obviously was not because the charges made by the railroad was excessive, but because somebody else took a toll that was excessive. This somebody else was either the commission merchant or the retailer. If, as the commission merchants' communications to us necessarily imply, it was the retailer, why do the commission merchants carry on their propaganda against the railways instead of against the retailer?

The commission merchants complain that they and the grower, under present conditions, cannot make reasonable profits. Doubtless it never occurred to them that the railroads have some right to make a reasonable profit. The commission merchants say that the "turn-over" on their business averages only 2½ per cent. In the year 1920 the net operating income of the railways of the United States was only $62,000,000, which was a turn-over of less than 1 per cent on their total business, and, unlike commission merchants, they have enormous fixed investments upon which they must earn and pay a return or be plunged into bankruptcy. Railway rates were advanced last August because the railways were incurring an enormous deficit and without an advance in rates actually would have been thrown into bankruptcy. If without previous large reductions of railway operating expenses the rates in effect prior to last August should be restored, practically every railway in the country would speedily be rendered hopelessly insolvent. Nevertheless, the commission merchants and their organizations without the slightest consideration for the financial needs of the railroads, carry on a nation-wide propaganda to force down freight rates, and then, when the *Railway Age* attacks their propaganda, have the effrontery to write us letters urging us to be "fair" in our comments on their business and to refrain from "trying to break down that splendid spirit of co-operation which the shippers are building up with the carriers."

The fairness of the propaganda for reductions in freight rates on fruits and vegetables was illustrated at a recent conference between the southern lines and the watermelon growers. It was developed that the recent average increase in rates to northern points varied from 2.3 cents to 4.9 cents per melon. It was shown the grower received an average of 7½ cents per melon, and the carriers 12.7 cents per melon for transportation, or a total of 20.2 for the producer and railway, and that the melons sold in Baltimore for an average of $1 each, or 400 per cent more than the amount received by both the grower and the carrier.

In his recent testimony before the Senate committee J. Kruttschnitt, chairman of the Southern Pacific, gave the following facts regarding lettuce: "Parties in Washington calling themselves 'Producers and shippers of perishable and high tonnage commodities on the Pacific coast' had issued a circular containing the statement, 'Increased freight rates put tax of $185 per car on lettuce.' The increase in freight rates from California amounts to 7/10 of 1 cent for large sized heads running 54 to the crate. The number of heads grown per acre is about 9,530, which at 7/10 of a cent a head, makes the increase in the rate $66.71 per acre and not $185 as asserted. The cost to the producer of one carload of the lettuce sold to distributors in New York, all charges paid including transportation and refrigeration, was $638.51. The carload at retail prices sold in New York for $2,382. Naturally the question is asked 'who gets the other $1,743.49?' "

The *Railway Age* agrees with those who contend that the grower of fruits and vegetables is not, at present, receiving high enough prices for his products. It declines, however, to subscribe to the manifestly false doctrine of the commission merchant that the low prices being received by the grower are due to the present freight rates and that the freight rates should be reduced in order that the grower may make more money. It is the commission merchant, not the railroad, that buys the produce from grower and pays him the present low prices.

Since the commission merchants are so greatly concerned because of the low prices the grower is getting, we suggest to them that instead of advocating reductions in railroad rates to enable the producers to get better prices, they

might themselves voluntarily pay the grower higher prices. The commission merchants will reply, of course, that they are not making enough money, but neither are the railways. The railways are incurring heavy losses even with the present rates. The public certainly would be no more injured by the ruin of the commission merchants than it would by the ruin of the railways.

Undoubtedly many of the present railway rates are too high. Undoubtedly when the reductions in railway operating expenses that ought to be made have been secured many rates should and will be reduced. But those who, like the commission merchants, carry on propaganda grossly misrepresenting the effects of the present rates and advocating reductions absolutely regardless of the ability of the railroads to stand them, are not helping to solve the present railroad problem or any other problem that confronts the country, and they are in a very poor position to protest against alleged unjust attacks upon their own business.

Proposed Wage Reductions and Rates

REPORTS are being persistently circulated to the effect that the reduction in wages to be announced by the Railroad Labor Board in the near future will average only 10 or 12 per cent, or, as some reports have it, will aggregate about $400,000,000 a year. The circulation of these reports is accompanied by speculation regarding what changes in freight and passenger rates will be made if the reported reductions in wages are made.

The Railroad Labor Board has not itself made any public statement indicating what the total reduction in wages will be. There are reasons for believing that the reports mentioned regarding the probable extent of the reduction in wages are originating with persons who are interested in having them made as small as practicable.

The public should understand that if the average reduction in wages granted shall be as small as these reports indicate they will not be sufficient to make practicable any substantial reductions of rates. The advances in wages granted by the Railroad Labor Board on July 20, 1920, when the cost of living was about 112 per cent more than before the war, averaged about 20 per cent for each employee, and, on the basis of the number of men employed in 1920 amounted to about $775,000,000.

It made the average compensation per employee about 136 per cent more than before the war. The reduction in the average cost of living since that time, according to the most reliable estimates, is at least 40 per cent, and since the present wages were based chiefly upon the cost of living prevailing at the time they were fixed there seems no good reason why the reduction in wages should not be at least equivalent to the advance in wages granted last July. On the basis of the cost of living there would be justification for making the wages even lower than they were before the last advance in wages was granted.

With the present wages in effect, it was found in the latter part of 1920, even when the railways were handling a heavy business, that they were failing at the rate of about $500,000,000 a year to earn a net return at the rate of 6 per cent upon the valuation placed upon their properties by the Interstate Commerce Commission.

The business being handled at the present time is much smaller than then and the railways thus far in 1920 have earned almost no net operating income at all. Unless, therefore, the Railroad Labor Board shall both wipe out the national agreements and make a reduction of wages equivalent to the advance in wages which was granted last summer, the prospect of any substantial reduction in rates necessarily will be very remote.

Letters to the Editor

"A Protest from the Commission Merchants"

WASHINGTON, D. C.

TO THE EDITOR:

Our attention has been directed to an editorial in the *Railway Age* under date of April 22, headed "Piratical Commission Merchants' Attacks on Freight Rates" which for its vehemence and misstatement of facts in an attempt to influence the public mind against the commission merchants, savors only of railroad propaganda, and, we are convinced, will act as a boomerang in its attempt to influence the minds of those high in authority, who have under consideration the necessary downward adjustment of freight rates.

These organizations, representing as they do many of those whose honesty and sincerity of purpose you so unjustly attack, are now in the thirtieth year of successful operation and are recognized by the carriers and governmental agencies as one of the indispensable and most important links in the chain of economic and proper distribution of fruits and vegetables. Therefore, their officers and members strongly and justly resent your unwarranted attempt to defame an industry so important to the carriers, the producers and the consumers of this country.

In your editorial, you link up with the commission merchants in this alleged "piratical attack" two of the leading trades papers, viz., the Packer and the Produce News, and say that the commission merchants through and in conjunction with these and other trades papers, are conducting one of the most dishonest and selfish propagandas you have ever observed. Why shouldn't we use those papers which print facts concerning our industry and not such papers as the *Railway Age*, which evidently panders to anything that will give the public a misconception of facts concerning the so-called middleman, or commission merchant. It was the Packer which took the very statements upon which your editorial was based concerning the enormous profits on onions, spinach, etc., and proved by actual conditions and government figures the falsity of your figures and that instead of the alleged high profits, the dealers suffered a loss.

These organizations composed of wholesale dealers and distributors of fruits and vegetables, hold no brief for the retailer whom you have linked up with the commission merchant, but we do feel that you owe to them the same duty you owe to us; that of investigating and proving your facts before attacking, and inflaming the minds of the consumer, with unjust and unwarrantable statements regarding the retailer, which can but have the effect of retarding the free movement of fruits and vegetables with resultant injury to everyone concerned, and not the least to the railroads.

In your editorial you go so far as to say that "It has long been known that the commission merchants dealing in fruits and vegetables have been among the most remorseless profiteers in this country." If this was not such a serious utterance, we would be inclined to laugh. It is serious because it is such a bald, deliberate misstatement of facts. Why didn't you take the time to investigate and really find out what the average margin of profit is on the annual gross sales of the commission merchants? We can tell you that it is less than 2½ per cent. Why didn't you take the time to look up in connection with the question as bearing on profits, the financial statement of the United States Food Administration, completed on February 1, 1919, which showed the net profit of the wholesale fruit and vegetable dealers in the United

States from August 1, 1917, to August 1, 1918, to be 2.42 per cent on the turnover? This should be ample evidence, and will be to the right thinking mind, that the fruit and vegetable trade was and is efficient in the performance of its duty and by no stretch of the imagination could be considered profiteers.

You know, we know, and the carriers know, that freight rates are too high. The issue cannot be dodged by such attempts as your paper is making. President Harding in his address to Congress said: *"Freight carrying charges have mounted higher and higher until commerce is halted and production discouraged. Railway rates and cost of production must be reduced."*

Every word of this is true, so let's go at it in a sensible way, as this industry is doing with the carriers and every one concerned, and work out the problem. Stop your mud slinging and get down to facts.

We recall that in 1917, on invitation from you, R. S. French, general manager and secretary of the National League of Commission Merchants of the United States, served as one of three judges in a contest put out by your paper for the best paper on "The Reconsignment and Diversion Privilege," for which a prize was awarded. This was an interesting, constructive and instructive contest and experience.

Why not continue a constructive policy and devote your energy to a campaign of investigation to determine the effect of the high transportation costs on the commerce of the country?

The congress wants this information, and so does the Interstate Commerce Commission in its investigations which are now going on, and will welcome real facts such as these and other organizations are giving them.

Do this instead of trying to break down that splendid spirit of co-operation which the shippers are building up with the carriers and which was so manifest in the conference between seventeen railway traffic executives and representatives of shippers at New York on November 17 and December 14, 1920, and of which Chairman Clark of the Interstate Commerce Commission was advised, and to which he replied as follows:

"I appreciate your promptness in giving me this information and I desire to express to you the satisfaction which I feel over the fact that such a meeting has been held, and congratulate you upon the spirit which was entertained by those in attendance and the acquiescence in the broad principles which it was agreed should be followed. I have an abiding faith in the good effect of such conferences and of the great good that will come from the developing and fostering the spirit which prompted calling the conference and which permeated the proceedings. I sincerely trust that this spirit will not be allowed to languish but that it will be accepted and co-operated in by all of those who were present in person and that the result may be a general acceptance of the principles agreed upon and a cordial determination to not only abide by them but to further their acceptance by others.

"This spirit is especially fitting preceding the holiday period when our minds turn to 'Peace on earth, good will to men,' and I hope that it may survive as all truly good and right things survive."

We were a party to this conference and like all other shippers, we are doing everything possible to carry out the spirit and understanding of the conference.

As we write this letter, our attention is called to an article in the Packer of May 6, in which it is stated that at the request of fruit and vegetable dealers in Kansas City, you met with them on Wednesday of last week in the Chamber of Commerce and were given first-hand information concerning profits and losses of wholesale dealers; that you acknowledged to the dealers at this meeting that you had made no investigation concerning wholesale selling prices before writing your editorial, but tried to justify its publication by pointing out that retail prices were high compared with the prices producers were receiving; that it was also shown you that wholesale prices, after transportation costs were paid, were out of line, and that your article, insofar as it concerned the wholesaler, was utterly wrong. It is also stated that you admitted that transportation rates should be reduced, but stated that operating expenses of the carriers precluded such reduction at the present time.

In view of these statements, the accuracy of which we have no reason to doubt, and as your editorial article was directed primarily at the wholesaler, you should at once set the public right, through your paper, by a frank admission of your error and a retraction of your statement, which we trust you will do. Furthermore, in fairness to the members of these organizations and others whom you have so unjustly attacked in your editorial, we ask that you print and give to this letter the same prominence in the next issue of the *Railway Age* as you did to your article.

NATIONAL LEAGUE OF COMMISSION MERCHANTS OF THE UNITED STATES
F. WM. MORF, President
R. S. FRENCH, Gen'l Mgr. and Sec'y.

WESTERN FRUIT JOBBERS ASSO. OF AMERICA
A. D. HITZ, President
W. D. TIDWELL, Sec'y.

INTERNATIONAL APPLE SHIPPERS' ASSO.
E. T. BUTTERWORTH, President
R. G. PHILLIPS, Sec'y.

Freight Rates Not Restricting Traffic Movement

HOUSTON, TEXAS.

TO THE EDITOR:

I have read with great interest the editorial in the *Railway Age* of April 22 concerning the propaganda which is being carried on in the United States to bring about a reduction in the freight rates. These propagandists are claiming that the high rates are curtailing the movement of traffic. They evidently fail to remember that traffic was likewise curtailed during the panic of 1907 and again in 1914, when the freight rates were very low.

As a practical example that high rates do not curtail traffic to any extent we have before us at present the situation in Mexico. There is considerable accumulation of traffic for Mexico at all of the Rio Grande crossings, due principally to the shortage of motive power on the National Lines of Mexico. In order to help out this situation the Mexican lines have for some time been allowing private concerns, such as mining companies, contractors and others to operate trains over the tracks of the National Lines. These private concerns charge the full freight rates in effect in Mexico, plus 50 per cent, and they have all been offered more traffic than they have been able to handle on this basis. It is understood that they pay the Mexican Railway Lines the regular rates and the additional 50 per cent is retained by them for their services.

It has been stated recently that shippers in some cases have offered to pay these private train operators as much as 100 per cent more than the regular tariff rates in effect in Mexico in order to get their traffic handled.

As a practical illustration, this would seem absolutely to dispute the statements of the propagandists in the United States that the present freight rates are restricting the movement of traffic.

THORNWELL FAY,
International & Great Northern.

A BILL has been introduced before the Illinois legislature to require all railroads to construct and maintain an illuminated danger signal on each side of the railroad at all highway grade crossings. The bill provides that the signal shall consist of a wired glass disc not less than 17 in. in diameter with a 5⅜-in. optical lens in its center, and light to be projected by intermittent flashes of not less than 30 per minute; all crossings to be equipped before July 1, 1922. It is estimated that it would cost about $650 to equip each highway crossing as here provided, and approximately $60 a year for maintenance and inspection.

Record Train Loading Features Virginian Operation

Describing the Methods Used to Handle Loads of 8,000 to 9,000 Tons in Regular Course

All records for heavy train loading were shattered on Wednesday last when there was handled from Princeton, W. Va., eastward to Roanoke, Va., on the Third district of the Virginian Railway, a train of 100 loaded 120-ton cars of coal aggregating 16,000 gross tons. This train was a test train run to demonstrate what could be done with the new 120-ton cars and the heavy power used by the Virginian Railway. It marks the latest step in the progress towards heavier train loading which has characterized the operations of the Virginian Railway since its inception.

The Virginian Railway's theory of operation is stated in the following words: "The more loads you haul in one trip the less trips you'll have to make." The road was built with that idea in mind. Today the company is operating with the largest capacity equipment and most powerful locomotives which are in service in this country and therefore in the world. The success the road has been having in working out its scheme of operation is attested by the fact that the road is hauling in regular service trains of 90 to 100 loaded cars aggregating 8,000 to 9,000 gross tons. The average net tons per train—the figure which includes all freight trains of whatever kind—in 1920, totaled 1,800, the largest for any road in the country. A study of the operations of the Virginian Railway is further of interest because in 1920 the road was one of the few which earned well over its standard return and guaranty. In the first three months of 1921 its net railway operating income exceeded that for the same three months of 1920.

Of Exceptional Engineering Standards

The Virginian Railway was built by H. H. Rogers of the Standard Oil Company who had become financially interested in coal properties in West Virginia, particularly in the neighborhood of Page. Mr. Rogers built a short line to a connection with the Chesapeake & Ohio, but being unable to secure from that carrier a division of the through rates, or a satisfactory outlet over the Norfolk & Western, he conceived the idea of building a line of his own to tidewater. The result was the Virginian Railway. In building this line, Mr. Rogers spared no expense and the final result insofar as the project was carried out before Mr. Rogers' death was a low grade line of exceptional engineering standards. Unfortunately Mr. Rogers died before the road was put in complete operation. At his death the line from Princeton, W. Va., east to tide-water had been put in its desired shape, with one pusher grade of 0.6 per cent on one district, with grades against eastbound traffic of but 0.2 per cent otherwise on the three districts and on the whole with a line descending to tide-water. The line west of Princeton—that is, into the coal fields themselves, was not up to the standards which characterized the other three districts. It has gradually been improved, however, the most important feature of this improvement being the double tracking and accompanying tunnel widening between Elmore and Clark's Gap now nearing completion. Eastbound traffic at this point has to overcome a 2.07 per cent grade and until this work was carried out this section was in reality the neck of the bottle in the road's operations.

Bituminous Coal 90 Per Cent of Traffic

The traffic of the Virginian is predominantly bituminous coal, the tonnage of that commodity making up about 90 per cent of the road's total tonnage. In 1920 the proportion was 92 per cent. This coal all moves eastward, about 80 per cent of the total being dumped at tide-water. The coal is secured on the main line and branches which constitute what the Virginian terms its Deepwater district. The Virginian's lines reach a few mines in the Pocahontas coal fields, but, as will be seen from the map, by far the larger part of the tonnage is secured in the New River fields. This New River coal moves to tide-water under a rate of $2.80; the average haul is 410 miles.

The Virginian Railway

The coal territory is adjacent to the New River fields served by the Chesapeake & Ohio, and in fact a larger number of mines are served by both roads through trackage agreements which permit mines to ship over either road. New River coal is a low volatile steam coal. Until the last few years the demand for it was for bunker coal and for coastwise movement to industries in New England, etc. During the war large quantities of the better grades were supplied to the United States Navy. With the elimination of British coal during the war and the subsequent disorganization of the British coal mining industry, there arose a great demand for this coal for export with the result that the coal business in the Virginian's territory has increased by leaps and bounds. The prospects of the British coal now are rather problematical, but it is probable that the

growth of American export business will be continued, in which case except for uncertain periods, like the present, the Virginian's traffic will continue to expand in large proportions. In 1920, the road handled 7,621,555 tons, representing an increase of 32 per cent over 1919. This coal was supplied by 103 mines, of which 73 are on lines owned by the Virginian and the remainder on the lines of the Chesapeake & Ohio, or on the Kanawha, Glen Jean & Eastern, a coal property.

The rapid expansion of the Virginian's coal business can best be shown by the following figures:

Year	Total tonnage all freight	Coal tonnage	Coal dumped at tide-water
1911	2,713,135*	2,141,009*	2,012,445
1912	3,614,011*	3,103,309*	2,474,052
1913	4,410,622*	3,775,423*	3,283,667
1914	4,776,663*	4,122,987*	2,841,483
1915	4,088,609*	3,603,390*	.....
1915	4,415,952	3,890,565	3,116,903
1916	6,093,013	5,509,798	4,366,243
1917	7,096,532	6,398,836	4,429,296
1918	6,866,089	6,279,289	4,220,778
1919	5,983,824	5,463,321	3,618,432
1920	.....	7,621,555	5,497,131

*Years ended June 30.

The Virginian is the third carrier, in point of coal business handled, in the Pocahontas district. The figures given above indicate that it is more than holding its own in this rapidly growing group and show what may be expected of the road in years to come.

The Virginian's Equipment

Inasmuch as bituminous coal constitutes so large a percentage of the total tonnage of the Virginian Railway, it is, of course, natural that its operations should be characterized by heavy train loading and by the features in general peculiar to handling traffic of this kind. It is next in order to see why it is that the Virginian is the leader in heavy train loading and how it is that the road is able to make up and handle a record-breaking train of 16,000 gross ton.

It has been noted that the Virginian has on its lines the largest cars and most powerful locomotives in use on any railroad. This equipment is as follows:

FREIGHT CARS

Number in service	Type	Capacity in lb.	Total capacity, tons
534	Box	80,000	21,360
182	Flat	80,000	7,280
944	Stock	80,000	37,760
148	Hopper	100,000	7,400
2,171	Steel hopper	105,000	113,978
998	Steel hopper	110,000	54,890
2,984	Flat bottom gondola	105,000	150,660
590	Flat bottom gondola	110,000	54,450
983	Flat bottom gondola	218,000	107,147
9,834			560,925

COMPARISON WITH PREVIOUS YEARS

December 31, 1918	8,896	452,057
December 31, 1919	8,875	451,192
December 31, 1920	9,834	560,925

LOCOMOTIVES

Number in service	Type	Class	Tractive effort	Total
5	0-8-0	SA	45,200	226,000
6	4-4-0	EA	21,400	128,400
4	4-6-0	TA	30,900	123,600
6	4-6-2	PA	44,300	265,800
1	2-8-0	CA	29,400	29,400
2	2-8-0	CA	29,400	58,800
2	2-8-0	CB	29,400	58,800
1	2-8-0	CC	29,400	29,400
2	2-8-0	CD	29,400	58,800
				979,000
2	2-8-2	MA	45,200	90,400
4	2-8-2	MA	45,200	180,800
42	2-8-2	MB	56,000	2,352,000
18	2-8-2	MC	60,800	1,094,400
4	2-6-6-0	AA	70,800	283,200
8	2-6-6-0	AC	90,000	720,000
1	2-8-8-2	AB	97,400	97,400
6	2-8-8-0	AD	115,000	690,000
10	2-10-10-2	AE	147,200	1,472,000
20	2-8-8-2	US	101,300	2,026,000
				9,006,200
144	locomotives	Total		9,985,200 lb.

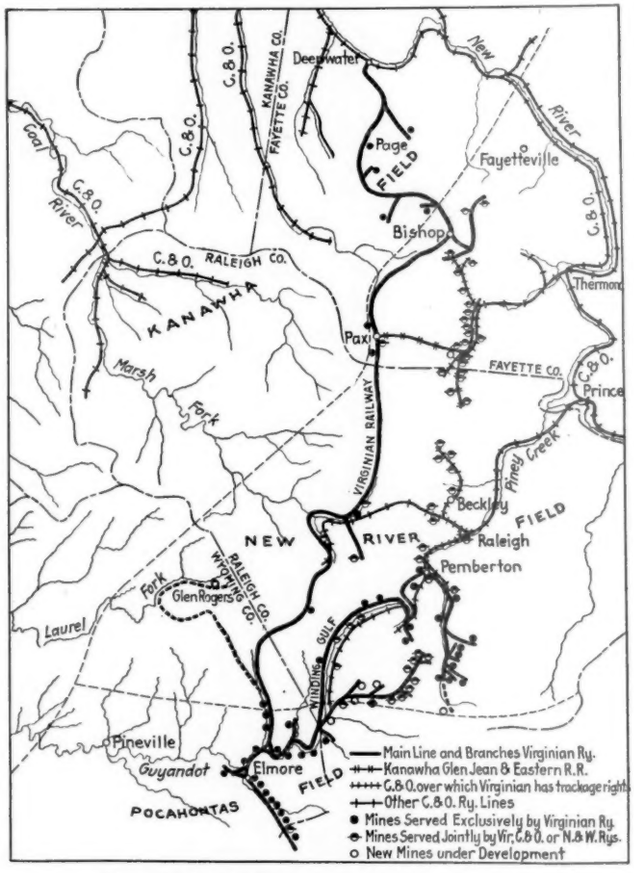
TOTAL LOCOMOTIVE TRACTIVE EFFORT COMPARED WITH PREVIOUS YEARS

December 31, 1918	119	7,859,700
December 31, 1919	139	9,884,700
December 31, 1920	144	9,985,200

Probably the most noteworthy feature of these figures, other than the size of the equipment used, is the great increase which has been made in the total tractive effort of the locomotives and the total carrying capacity of the cars.

Cars Assembled at Elmore, W. Va.

It has been noted that the Virginian secures its coal along the lines in its Deepwater district. As will be seen from the map showing the coal district, all the mines, excepting a very few, lie north of Elmore. The cars of coal are assembled by mine runs and brought into Elmore. The yards at Elmore have a capacity of almost 800 cars, and they serve also as the distributing center for empties returning



The Coal Fields Served by the Virginian

to the mines. From the yards at Elmore the loaded cars must be brought up to Princeton. Between Elmore and Clark's Gap there is a grade against east bound traffic of 2.07 per cent. The usual procedure is to make up trains of about 75 cars handled by an AA, AC or US Mallet with two of the heavy AE or 2-10-10-2 type Mallets cut in the train. These pushers are dropped off at the summit or Clark's Gap whence the single Mallet handles the train to the end of the freight district at Princeton. The AE Mallets are the largest locomotives in service on any railroad. They have a total weight in working order, including engine and tender, of 898,300 lb. Working simple, they have a tractive effort of 176,000 lb. and compound, 147,200 lb. The Virginian owns 10 of them. It was an engine of this type which was used to handle the test train of 16,000 gross tons mentioned as setting a new record in heavy train loading. The 14 miles of 2.07 per cent grade between

Elmore and Clark's Gap was at one time the most difficult obstacle the operations of the Virginian had to overcome. With the larger power in the form of the AE Mallets and the double tracking now nearing completion, the problem is by way of being solved.

The following figures showing the amount of coal moved over Clark's Gap will indicate clearly the results that have been attained:

COAL MINED OVER CLARK'S GAP

	1920				1919			
Month	Trains	Loads	Tons	Loads at mines	Trains	Loads	Tonnage	Loads at mines
January ...	203	11,012	863,114	11,223	137	8,048	606,735	8,181
February ..	159	8,604	674,515	7,845	85	5,167	383,384	4,624
March	203	11,996	941,501	12,066	114	6,049	457,018	5,437
April	191	11,798	922,507	11,383	86	5,300	396,281	5,202
May	135	8,267	640,467	8,287	122	9,000	688,869	8,801
June	181	11,069	866,207	11,257	142	10,032	774,197	9,383
July	218	13,521	1,056,296	13,492	125	8,989	675,932	8,865
August	241	13,457	1,052,667	13,517	152	10,597	827,424	9,862
September..	217	12,842	1,009,044	12,813	157	10,938	848,489	11,055
October ...	242	13,947	1,095,729	13,361	179	11,749	914,536	11,807
November .	220	11,640	903,894	12,321	161	9,927	773,693	9,855
December...	231	10,749	868,133	10,064	160	9,498	745,226	10,120
Total...	2,441	138,902	10,894,074	137,629	1,620	105,294	8,091,784	103,193

The following brings the table up to date and gives some interesting details concerning trainloading in 1921 as compared with 1920:

	Trains	Loads	Tons	Loaded	Average tons per train in 1921	Average tons per train same month, 1920
January	272	9,852	852,857	11,028	3,135	4,350
February	129	6,617	558,757	6,630	4,331	4,233
March	110	6,712	569,529	6,995	5,177	4,638
April	132	8,153	695,444	8,868	5,268	4,829

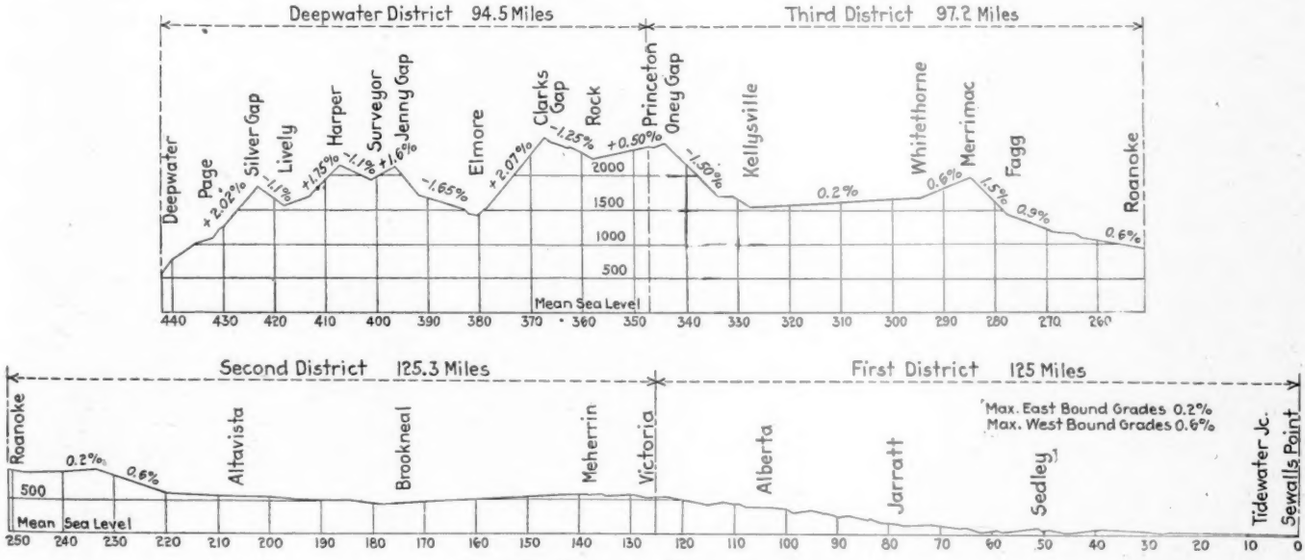
Dropping Trains Down 1.5 Per Cent Grade Present Operating Feature

With the difficulties contingent upon the operation of the trains up the Clark's Gap hill nearing solution, the next problem that had to be attacked was that of dropping the trains from Princeton east. Beginning at a point a short distance east of Princeton, there is a descending grade of 1.5 per cent down to Kellysville, 12 miles from Princeton. Between Princeton and Roanoke—the third district 97 miles in length—the coal trains are operated in 80 to 100 car-lengths, their tonnage averaging from 8,000 to 9,000 tons depending upon the size of the cars making up the train. To handle trains of this size with one locomotive down a 10 or 12 mile descending grade of 1.5 per cent was not a thing that could be worked out in a day. Naturally, the problem was one of securing proper braking capacity; its solution came about through the use of the empty and load brake, by which as is well understood, the loaded car may be given considerably more braking capacity than when empty. The Virginian has about 2,000 cars equipped with the empty and loaded brake. One thousand of these are hopper cars of 110,000 lb. rated capacity; the other thousand are the new 120-ton gondola cars which have recently been put in service. It was early developed that to secure the required results, it was necessary to put in a train cars with the empty and load brake to the amount of 15 per cent of the total train—in other words, 15 cars in a total of 100. At first it was thought necessary to keep the empty and load brake cars at the front of the train. This was later found to be unnecessary, so they are now distributed throughout the train as they happen to come, the only requirement being to get the 15 per cent empty and load brake cars.

A Train of 16,000 Gross Tons

The impressive run—the peak of heavy train operation on any railroad—which was made on the Third district of the Virginian on Wednesday, May 25, presumably sets a record in heavy train loading which will not be again reached for some time. On that day a train of 100 of the new 120-ton gondola cars, each loaded to its full capacity, making an aggregate train load of approximately 16,000 gross tons, was successfully handled both on the heavy grades and on the comparatively level sections between Princeton and Roanoke. This train was handled with one of the Virginian, Class 800, AE 2-10-10-2 Mallet locomotives at the head end. Pushers were used in starting the train and on the grade between Rich Creek and Merrimac, as noted in a following paragraph.

The distance from Princeton to Roanoke is 97.2 miles. Train operation over this district, as has been noted, is down a descending grade beginning a short distance out of Princeton and extending to Kellysville, 12 miles east of Princeton, the grade being of 1.5 per cent. The successful operation of the train down this grade was the real test which the train had to meet. From Rich Creek east of Kellysville there is an ascending grade of 0.2 per cent which presents no particular difficulty. Between Whitethorne and Merrimac an ascending grade of 0.6 per cent is encountered and in regular operation, as in the case of the test train, pushers are used. Beyond Merrimac, there is a short descending grade of 1.5 per cent, followed by descending grades of 0.9 per cent and of 0.6 per cent into Roanoke.

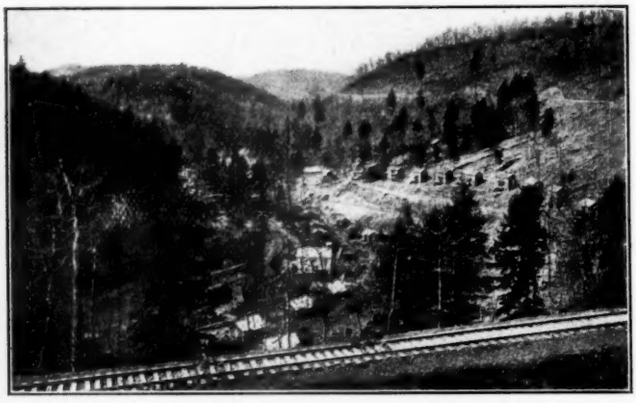


The Profile of the Virginian Railway

Test Demonstrates Train Load Limit Not Yet Reached

The project of handling this long and heavy train over this particular district was undertaken with the idea of demonstrating that the limit for train loading has not yet been reached and also to observe, in actual service, the new Westinghouse empty and load brake with which the cars are equipped. During the run to Roanoke, records of the brake performance were made by means of recording instruments on the locomotive, on the fifth car and on an observation car at the rear end of the train. The speed of the train was also shown by speed indicators installed in the observation car.

To start the loaded train at Princeton, three eight-wheel switching locomotives were used as pushers, these being dropped when the train had reached a speed of 12 miles an hour. A 2-8-8-2 Mallet pusher was also used from Rich



A Coal Operation on the Winding Gulf Branch

Creek to Merrimac, over the 0.2 per cent grade to Whitethorne and thence up the 0.6 per cent grade from Whitethorne to Merrimac. The start at Princeton was made smoothly. The run down the 1.5 per cent grade from Princeton to Kellysville was made at a speed of 20 to 27 miles an hour under control at all times. Due to the long and heavy train it was necessary to put a pusher on at Rich Creek instead of at Whitethorne as is done in normal operation. The pusher was dropped at Merrimac. From Merrimac to Fagg down the short stretch of descending 1.5 per cent grade, the train was handled at a speed of from 20 to 30 miles an hour, and from there on to Kumis and Roanoke at 15 to 20 miles an hour. During the trip the train had two break-in-twos due to defective knuckles and to the fact that the engineman was not familiar with so heavy a train.

Before starting on the run to Roanoke a thorough inspection of the train was made and every precaution taken to have the cars and brakes in good condition. In order to insure proper action of the brakes, and also to demonstrate the special features of the empty and load brake to the railroad men and other engineers and observers who were present, a number of standing tests were made in the yard at Princeton. For the purpose of making these standing tests, the train was parted at the middle, the two parts placed on adjacent tracks, and the brake line connected up so that the front and rear ends were brought near together where both the start and finish of the brake action might be observed. These tests included an emergency serial action of the brake which was completed in 7.5 seconds; a quick service serial action in 10.5 seconds; and an emergency action in 7.75 seconds after the completion of a heavy service application. The value of such a brake performance, particularly in the severe service on the Virginian, will at once be apparent to men familiar with train operation. Demonstrations were also made of the operation of the take-up cylinders; the operation of the brake under both empty and load conditions; and the automatic return from load to empty position.

On Thursday, May 26, a train of seventy-five empty 120-ton gondolas was hauled up the grades from Roanoke to Princeton. During this run tests were made of the empty and load brakes in order to demonstrate the practical elimination of shocks during heavy service and full emergency applications.

The train was hauled by a 2-10-10-2 Mallet to Rich Creek. A full service stop was made west of Salem (about 8 miles west of Roanoke) from a speed of 18 miles an hour in 38 seconds with a brake pipe reduction of 12 lb. A full emergency stop was made on the grade near Eggleston (about 55 miles west of Roanoke and 22.6 miles east of Rich Creek) in 18 seconds from a speed of 20 miles an hour with the brakes in the light capacity position.

On Friday, May 27 (today), it is intended to take another heavy train over the line from Princeton to Roanoke. On this run more complete records will be made of the application of the brakes. The data thus obtained will be the basis of an exhaustive study of the problem of braking extremely heavy trains on severe grades and the handling of practically empty trains of about one-third the tonnage in the opposite direction—a condition which prevails on the Virginian Railway. Tests are to be made of the reserve capacity of the brake which is designed to compensate for losses due to air leakage on individual cars even though the leakage might exceed the capacity of the air compressors. For this test, air leakage will be purposely caused on a number of cars. Emergency applications will be made and also emergency application after a heavy service application.

The records for the entire four days' test will be compiled by the engineers in charge and will be available at an early date.

Some 150 railway officers and supply men were present at the tests. The party was in charge of R. C. Cusick, of

One of the Mines on the Virginian Railway

the Westinghouse Air Brake Company, and the members of it were the guests of the Westinghouse Air Brake Company under the auspices of which company and the Virginian Railway, the unusual tests were conducted.

Big Cars Not Run in Solid Trains

The Norfolk & Western in using its large 100-ton cars runs them in solid trains. This the Virginian does not do. The test train of 16,000 tons, however, was a solid train of 100, 120-ton cars, which explains why it is that it totaled 16,000 tons, while the 100-car trains run in regular operation total from 8,000 to 9,000 tons.

Between Princeton and Roanoke, the trains are handled by a U. S. Mallet of the 2-8-8-2 type and of a tractive effort of 101,300 lb. Other than the complication accom-

panying the handling of the trains down the grade to Kellysville, there is no other difficulty met with, other than the fact that a pusher—an MC heavy Mikado, is used on the 10-mile 0.6 per cent grade between Whitethorne and Merrimac.

From Roanoke east over the Second and First districts, there are no complications to operation, the maximum east bound grades being out 0.2 per cent and the descending

There Are Two Car Dumping Machines at Sewalls Point Pier. This Tandem Dumper Handles in One Operation Two 55-Ton Cars or One 120-Ton Car

grades 0.6 per cent. The MC Mikados are used between Roanoke and Victoria and MB and MC Mikados east from Victoria.

41.6 Miles Per Car Per Day in 1920

The most interesting feature of the Virginian's operations that we have yet to discuss is the operation of the Sewalls Point pier, the tide-water terminal at Norfolk or Hampton Roads. Before discussing that facility, it may be interesting to note one of the other features of the Virginian's operations that gives it another reason to stand out as an exceptional road. In 1920, the Virginian moved its cars on the average of 41.6 miles per day. During April, 1920, its best month, the car miles per day of coal cars was 61.9 and of all cars 48.1. With its heavy car loading averaging 53.4 tons per loaded car, it is not surprising that in the twelve months of 1920 a figure should have been reached of 1,152 net ton miles per car per day.

A great deal might be said of the engineering standards of the Virginian Railway. That feature of the Virginian is, however, well known and comments concerning it have appeared in these pages from time to time. The road was built with more than ordinary foresight. Other than its low grades, it is characterized by bridges built in many places for double track over which but one track has been laid, and over which the other track may not be laid for some time. Nevertheless, the builders, even with all their foresight, did not foresee how important a carrier their road was to become or how great strides it was to make in the way of heavier and larger trains. These aspects are shown by the fact that a large number of the sidings are not long enough to hold the heavy trains. The method adopted, therefore, is for the loaded trains to keep the main line at all times. Trains of empties, and such few passenger trains as are run, take the siding and the heavy trains are run around them. Another difficulty the Virginian has to contend with is maintenance, the heavy locomotives and cars being especially hard on track. The rail now being put in track is of 100 lb. weight, although some 130 lb. rail has been laid, more particularly on the hill up to Clark's Gap. A considerable amount of 85 lb. rail is still in use. The road is rock ballasted practically throughout; the plates are used on curves only. With all the care that is taken derailments occur occasionally and in all fairness, it must be said that they are a potential handicap which is always present.

The Facilities at Tide-Water

In 1920 the Virginian dumped at its tide-water pier at Sewalls Point on Hampton Roads a total of 5,497,131 tons

The Elevator Which Carries the Heavy 120-Ton Tractor Cars to the Top of the Pier. The Inclined Track to the Left Is the Barney Incline Used by the 60-Ton Tractor Cars; the Center Track Is That by Which the Tractor Cars Return to the Foot of the Pier

of coal, or a million tons more than was dumped in the best previous year, 1917. The best month in 1920 was October, when 581,968 tons of coal were handled. The pier, when working at its capacity, can dump 90 cars an hour. The best record it has ever made for a single day is 675 cars; an average day's dumping approximates 475 cars. One of the performances to which the road points with particular pride is that of having put on the U. S. Collier Orien, 10,000 tons of cargo coal and 250 tons of bunker coal in 6 hours and 15 minutes, the loading going on simultaneously with that of other ships.

The fact, mentioned above, that approximately 80 per cent of the coal handled over the Virginian is dumped at

tide-water, shows how important is the Sewalls Point coal pier in the efficient operation of the railroad. The coal pier when it was built was of the most modern type yet constructed up to that time. It has since been considerably increased in capacity and through the improvements that were made is still one of the leaders among facilities of its kind.

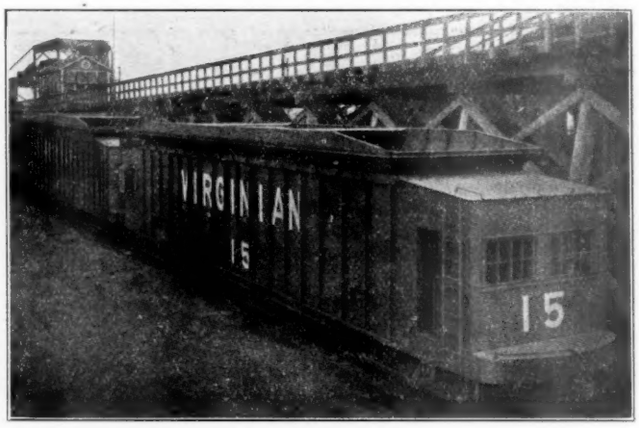
The pier is of steel construction and is electrically operated. As built originally, it had a car dumper of sufficient capacity to handle 55-ton cars. The road cars were classified and brought forward as needed into a storage yard known by the name of a "barney" yard built on an incline descending towards the pier. When a car was to be dumped it was dropped down by gravity to the pier and pulled up onto the dumping machine by a barney and cable. It was then turned over on the dumping machine, the coal falling into a 60-ton self-propelled electric tractor car, whereupon the empty car was kicked off the dumping machine by the following car, run upon a kick back and then moved by gravity down to the tracks for empties. The tractor car was then run over the scales, propelled to the top of the pier by a barney and then proceeded forward under its own power to the place on either side of the pier where it was to be dumped. The car had two hoppers which were dumped by air. The coal fell into the desired hopper on the pier and thence down the chute into the hold of the ship. The empty tractor then proceeded to the end of the pier and ran by gravity down a track in the center of the pier back to its starting point. With this method of operation, about 30 cars could be dumped an hour when the pier was worked to its capacity.

A Tandem Dumper of 120-Ton Capacity

The addition in capacity included the installation of an additional car dumping machine of 120-ton capacity. This machine operates similarly to the original one which it supplemented, except that it handles at one time two 55-ton cars or one of the new 120-ton capacity cars. New electric tractor cars were added, these being of 120-ton capacity. They have three hoppers instead of two and are carried to the top of the pier, not by a barney arrangement, but by an elevator. They are dumped in the same way as the 60-ton cars and are returned to the foot of the pier down the same inclined track as before. To facilitate their operation down this track, they are equipped with dynamic brakes. This new dumper can handle in one hour, when working at capacity, 60 of the 55-ton cars or a proportionate number of the 120-ton cars. With both dumpers working together, this gives us our capacity of 90 cars dumped in one hour. Twelve of the electric tractor cars are used, six of 120-tons capacity for the tandem dumping machine and six of 60-tons capacity for the single dumper.

The Virginian has at Sewalls Point a classification yard holding about 2,100 cars. Cars are classified into 12 classifications, 6 of these being pool classifications, and 6 other. The Virginian has the usual arrangement for pooling coal which is typical of the tide-water coal piers at Hampton Roads or at Baltimore. About 90 per cent of the coal handled is pool coal and coal for the two more important pools predominates. The usual procedure is for the coal to be brought forward to the barney yard as wanted, that yard holding about 90 cars. Under the present scheme of operation, the coal is weighed in the road cars instead of in the tractor cars as formerly, the car running over a 90-ton scale on its way from the barney yard to the foot of the barney incline up to the dumping machine. Inasmuch as the amount of work done is dependent upon the speed of the dumping machines, it is highly essential that these be in the hands of expert operators. Another feature of the operation of the pier is the extremely skilful manner in which the car riders spot their cars; operation is further assisted by what is termed a disappearing barney, this being a contrivance whereby the barney when about half way down on its return trip is dropped to a lower track than that on which it runs up the incline. Something should be said also of the skill of the motormen on the tractor cars and concerning the men who operate the hoppers and chutes of the pier itself.

It is interesting to examine some of the figures relative to the operation of the pier. It has already been noted



The 120-Ton Tractor Cars Used with the Tandem Dumping Machine at the Sewalls Point Pier

that the total dumpings in 1920 were 5,497,131 tons. This figure represented 25.5 per cent of all the dumpings at Hampton Roads, the totals for 1919 and 1920 having been as follows:

Road	1920 Tons	1920 Per cent	1919 Tons	1919 Per cent
Norfolk & Western	8,807,803	40.8	5,735,095	44.9
Chesapeake & Ohio	7,264,390	33.7	3,430,626	26.8
Virginian	5,497,131	25.5	3,618,432	28.3
Total	21,569,324	100	12,784,153	100

The largest dumpings for any month in 1920 were in October when 581,968 tons were dumped. The following figures will show how this coal was divided between bunkers, coastwise and export, and the comparison with the same month in previous years will be of special interest as pointing out the great increase in coal for export:

DUMPINGS AT SEWALLS POINT, MONTH OF OCTOBER

	1920	1919	1918
Coastwise cargo	112,733	110,249	194,987
Coastwise bunkers	3,117	7,476	6,908
Foreign cargo	385,432	267,772	41,903
Foreign bunkers	61,499	51,394	4,286
Total, including government coal and coal for inside capes	581,968	449,800	316,852

Other interesting figures showing the performance of the pier in October, 1920, the pier's best month and in April, 1921, the most recent month for which figures are available, are given as follows:

TOTALS FOR MONTH	October, 1920	April, 1921
Cars dumped	11,746	5,598
Average net tons per car	55.5	64.7
Gross tons dumped	581,968	323,490
Percentage of all coal dumped at Hampton Roads	27.8	25.8
AVERAGES PER DAY		
Cars dumped	430	215.3
Tons dumped	21,292	12,441
Average cars dumped per hour	18.7	19.2
Average tons dumped per hour	925.7	1,110

These figures for the two months selected are, of course, not strictly comparable because of the difference in the amount of the business handled. However, the increase in the average net tons per car dumped in April, 1921, over that for October, 1920, is especially noticeable. It should be further noted that the daily averages for April, 1921, given in the lower part of the table are affected by the fact that in that month, the pier was operated only 26 days, 14 days of which were on but one shift.

English Railway Bill Proposes Many Changes

Roads to Be Returned to Owners in August—Wholesale Consolidations Planned

LONDON.

COMPULSORY CONSOLIDATION of the railways of Great Britain into six large groups and the establishment of tribunals to deal with rates and wages are provided for in the government's bill to govern the conditions of the return of the roads to their owners which is to take place on August 14. The bill was introduced in Parliament by Sir Eric Geddes, Minister of Transport, on May 12, several weeks after the railway unions had presented a bill providing for government ownership and operation of the carriers. In view of the early date when government operation, under existing law, is to terminate, considerable irritation had been manifest in many quarters at the government's delay in bringing out its bill. The bill is divided into six parts dealing respectively with reorganization and consolidation, regulation, rates, wages and working conditions, light railways and general items

Wholesale Consolidations Proposed

The railways, exclusive of the underground or subway systems in and about London which are not considered in this bill, are to be divided into six distinct groups as follows:

1. Southern Group—London & South Western; London, Brighton & South Coast; South Eastern; London, Chatham & Dover.
2. Western Group—Great Western.
3. North Western and Midland Group—London & North Western; Midland; Lancashire & Yorkshire; North Staffordshire; Furness.
4. North Eastern and Eastern Group—North Eastern; Great Central; Great Eastern; Great Northern; Hull & Barnsley.
5. West Scottish Group—Caledonian; Glasgow & South Western; Highland.
6. East Scottish Group—North British; Great North of Scotland.

These groups which are to be formed on a regional basis are non-competitive, differing widely from the plan of the Transportation Act in the United States, which provides for combination into competing systems. The purpose of the consolidation, according to the bill, is the "reorganization and more efficient and economical working of the railway system of Great Britain." The principal railway companies in each group mentioned above are to be amalgamated into a single company. Other less important companies are to be absorbed in a manner provided by the act.

The consolidations are compulsory except that the bill provides for a variation in the grouping outlined, provided it is propounded on or before June 30, 1922, and is approved by the Minister of Transport and by a resolution passed by both houses of Parliament.

The constituent companies in each group are permitted to submit to the Minister a plan of amalgamation, in accordance with the provisions of the act, for his approval and for the approval of an Amalgamation Tribunal, consisting of Sir Henry Babington Smith, Sir William Pender and G. J. Talbot, on or before June 30, 1922. If such a plan is not presented or approved by that date, the Amalgamation Tribunal is to proceed with the formation of the groups which are provided for in the act. These amalgamations are to become operative January 1, 1923, unless otherwise directed by the Amalgamation Tribunal.

Shippers to Share in Management

The boards of directors for the amalgamated companies are, for the first year, to be elected from the boards of the constituent companies, the total number of directors on each board not to exceed 21 members. After the first year a board of 21 members for each group will be elected by the shareholders. Four members of this board are to be important shippers in the amalgamated company's territory. Employees are not, as had been expected in some quarters, to have places on these boards. Each member of the board will serve for three years with the exception of the first board elected, of which one-third of the membership will serve one year and one-third for two years, such members to be selected by lot.

Officers and employees displaced or otherwise affected as a result of the amalgamation are to be reimbursed by the amalgamated companies with rights to appeal to a standing arbitrator or board of arbitration appointed by the Lord Chancellor, this arbitrator or board having the power to award damages to be paid by the amalgamated company.

The major constituent companies of the various groups are to prepare plans for the absorption of the smaller railways in their respective groups. Such plans are subject to the approval of the Ministry of Transport and the Amalgamation Tribunal on or before June 30, 1922, in default of which the Tribunal will order the absorptions as it sees fit.

The Amalgamation Tribunal is to hold office until all matters under its jurisdiction are settled. This Tribunal may, and if so required by the Court of Appeal, must state in the form of a special case for determination by the Court of Appeal (the decision of which shall be final) any question of law which may arise before it. The Tribunal has the power to call and examine witnesses under oath and to demand the production of documents. The expenses of the Tribunal are to be met by the Minister of Transport but are to be repaid with interest by the amalgamated companies after they are formed.

Payment of Claims

The Bill provides that a total of $291,600,000 shall be set aside by the government for the payment of all claims by the railways which obtain at the end of the period of control, of which one-half will be available December 31, 1921, and the other half a year later. This sum will be distributed among the railway companies in accordance with a plan agreed to by themselves. In case of no such agreement the Amalgamation Tribunal shall decide upon the proportionate distribution. Out of the first $145,800,000, $121,500,000 is to be set aside for distribution among the railways in proportion to their net earnings for 1913, and the remaining $24,300,000 for distribution in payment of claims for compensation for any abnormal increase in the ratio of operating expenses over revenues for the period commencing August 15, 1921, and ending December 31, 1921, as compared with the ratio of operating expenses over revenues for the year 1913.

Of the remaining $145,800,000, a sum of $121,500,000 will be available for payment to the railways which on August 15, 1921, are in arrears in maintenance and replacements, in ratio to the extent to which they are so in arrears. The balance, $24,300,000, will be distributed similarly as the previous sum of like amount, but for the period of the year 1922.

Regulation of the Railways

The bill gives the Railway and Canal Commission or the Minister of Transport authority to require any railway company to afford reasonable railway services, facilities and con-

veniences which is proved to be necessary, unless the railway company can prove that any such undertakings would affect prejudicially the interest of the stockholders.

The Minister is to have the authority to require any or all railways to conform gradually to general standardization of way, plant and equipment, and to adopt plans for the co-operative use of rolling stock, shops and other facilities; unless the railway companies affected can prove to the satisfaction of the Railway and Canal Commission that the order is such that the capital expenditure involved would prejudicially affect the stockholders' interest. Existing leases or working agreements may be continued with the approval of the Minister, and all future agreements of this nature must receive this sanction.

Regulation of Rates

Rates are to be provided which yield the aggregate net revenue for 1913, plus a sum equal to 5 per cent on capital expenditures made by the railway during government control, plus a reasonable allowance for capital expenditures on revenue producing improvements (not to be less than £100,000 for any individual improvement) which at the beginning of 1913 had not become fully remunerative.

Authority over rates is vested in a Railway Rates Tribunal, consisting of three permanent members. The three permanent members, who are to hold office not more than seven years, are to be appointed by the King on the joint recommendation of the Lord Chancellor, the President of the Board of Trade and the Minister of Transport. The chairman of this Tribunal is to be a railroad man, one of the members a lawyer and the other a business man. The salaries of the members of this Tribunal and its employees are to be determined by the Minister of Transport and paid by the government, which is to be reimbursed therefor by the railways in a proportion to be determined by the Tribunal.

In order to secure a larger Tribunal when occasion may require, two panels, one made up of 12 shippers appointed by the president of the Board of Trade and another, consisting of 12 members representing the railways and appointed by the Minister of Transport after consultation with the Railway Companies' Association, are provided. When the Minister desires to add to the Rates Tribunal temporarily, he is given authority to select two, one from each panel.

The Rates Tribunal is to have power—

(i) to prescribe in relation to the carriage of passengers and merchandise by railway—

(*a*) The rates applicable to the carriage of merchandise and the conditions under which those rates shall apply;

(*b*) The conditions under which exceptional rates may be charged;

(*c*) The charges to be made as station and service terminals and the accommodation and services to be included in those charges;

(*d*) The fares for the conveyance of passengers and their luggage and the articles and things that may be conveyed as passengers' luggage:

(*e*) The conditions under which fares less than the standard fares may be charged;

(*f*) The conditions (other than those relating to dangerous goods) upon which merchandise shall be carried by railway:

(ii) to determine any questions that may be brought before them in regard to the following matters:

(*a*) The alteration of the classification of any article, or the classification of any article not at the time classified.

(*b*) The alteration of any standard charge;

(*c*) The granting variation or cancellation of any exceptional rate;

(*d*) The disintegration of any exceptional rate;

(*e*) The institution of new or the modification or cancellation of existing group rates;

(*f*) The variation of any toll payable by a trader (i.e. shipper) or by one railway company to another;

(*g*) The rebate to be allowed when any terminal services are not performed;

(*h*) The alteration of any terms and conditions which they may have determined or prescribed;

(*i*) The reasonableness or otherwise of any charge made by a railway company for any services or accommodation for which no authorized charge is applicable;

(*j*) The reasonableness or otherwise of any conditions as to packing of articles specially liable to damage in transit, or liable to cause damage to other merchandise;

(*k*) Whether any merchandise is properly included in the category of dangerous goods;

(*l*) The granting, variation, or cancellation of through rates with power to allow the rate with or without modification either as to amount or as to terms and conditions;

(*m*) The apportionment between the railway companies concerned of any through rate.

An entire new classification of freight is now being developed by the Rates Advisory Committee appointed under the Ministry of Transport Act, 1919. This is to be incorporated into the present bill and the constituent companies of each group must put forward before December 31, 1921, standard rates under this classification for their own particular group, for the approval of the Rates Tribunal. The Rates Tribunal is to determine after hearings just what the standard rates shall be for each individual group. No deviation from these standard rates will be permitted except:

(*a*) Where an exceptional rate has been granted.

(*b*) Where a special rate is granted for a special and non-recurrent purpose.

(*c*) Where in the case of two railways connecting the same places the route by the one railway is longer than the route by the other, in which case the company owning the longer route may charge the rate applicable to the shorter route.

(*d*) Where in the case of fares, fares lower than the standard fares are adopted under conditions prescribed by the Rates Tribunal.

The bill provides for a revision of these standard rates with the approval of the Rates Tribunal.

The bill further provides that the Rates Tribunal shall review the standard and exceptional rates yearly. If it is found that any company is earning in excess of its standard return and it is, furthermore, deemed advisable by the Rates Tribunal, the rates will be reduced so as to absorb 80 per cent of the excess of the net revenue earned during the year reviewed.

Wages and Conditions of Service

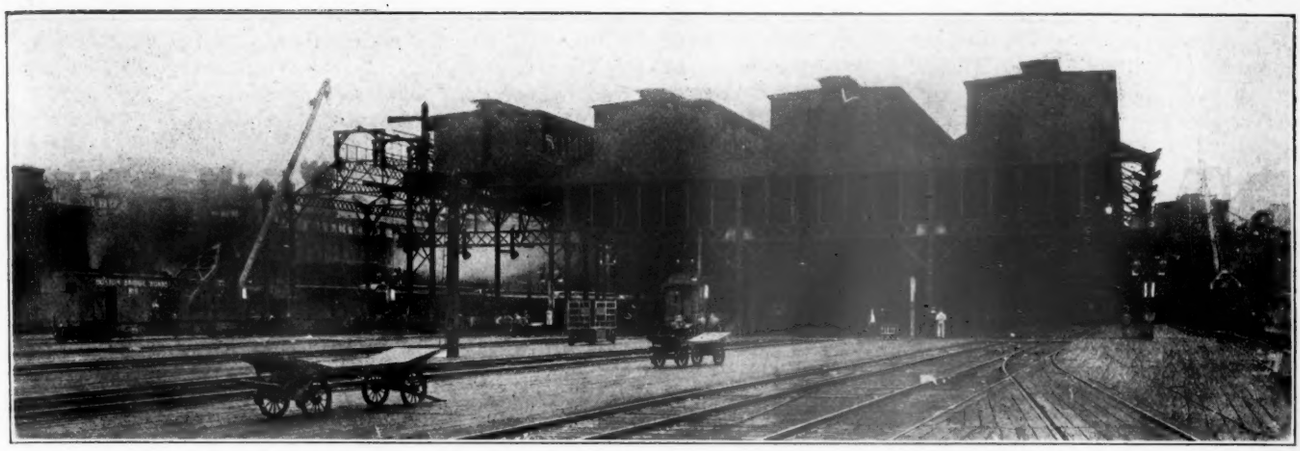
For the settlement of labor disputes the bill provides a Central Wages Board and a National Wages Board, the latter to consider appeals from the former. Councils are to be provided on each railway composed of officers of the railways and representatives of the employees. The constitution and functions of these councils are to be agreed upon by a committee consisting of six representatives from the railways and six from the various railway unions.

The Central Wages Board is to consist of five representatives of the railway companies, three representatives of the National Union of Railwaymen, and two representatives of the Associated Society of Locomotive Engineers and Firemen and the National Wages Board is to be made up of four representatives of the railway companies, four representatives of the two unions above-mentioned, and four representatives of the users of railways.

Further Powers of the Minister of Transport

The Minister of Transport is to be given authority over the light railways of the realm which has heretofore been vested in the Light Railway Commission. Furthermore, the Minister is empowered to prescribe forms and methods by which the railways are to keep their accounts and statistics.

SAFETY BULLETIN No. 53 of the Delaware & Hudson, reports the number of employees, on duty, killed in 1918 as 40; in 1919 as 18; and in 1920 as 19; and the number per million locomotive miles averaged in the three successive years 2.9; 1.5; 1.4. The numbers injured in the three successive years were 1,615; 920; and 1,815.

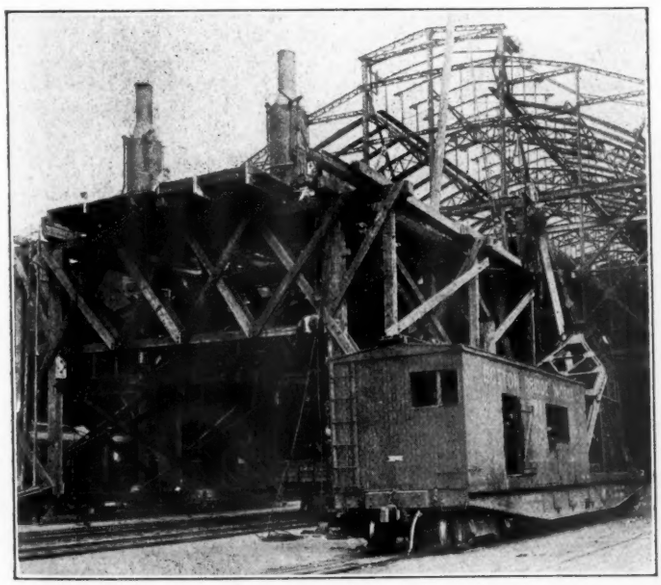


The Train Shed for the Boston & Maine Section of the Station Was of an Unusual Construction

The Passing of an Historic Passenger Train Shed

Structure Over Tracks of North Station, Boston, Removed After Nearly Fifty Years' Service

THE RECENT RETIREMENT of the train shed structure over the 23 tracks of North Station, Boston, marked the passing of two noteworthy train sheds. One of these was the arch shed over the six tracks of the original Boston & Lowell station, built in 1872 and one of the first large train

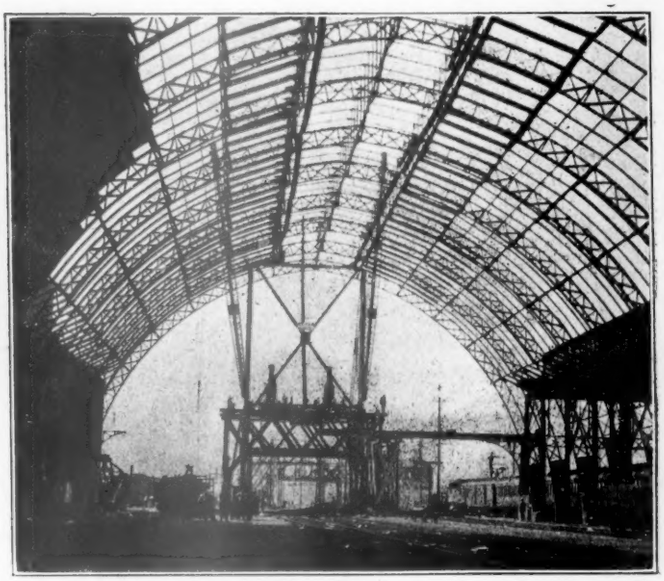


Erecting the Traveler Used to Remove the Old Boston & Lowell Train Shed

sheds constructed in this country. The other was the shed over the 17-track extension to the original station, built by the Boston & Maine in 1893 and 1894 according to a multiple gable or monitor construction that is unique in American station practice. Loss of metal by corrosion made it necessary to remove these old structures and they have been replaced by platform awnings or sheds of frame construction of the type illustrated in the drawings and photographs. The chief interest lies not in the new structure but in the old ones and the manner of their removal.

The Boston & Lowell structure which served its useful purpose for almost 50 years was composed of parallel braced arch ribs of 116 ft. clear span and 63 ft. clear height at the crown. That it was among the pioneer structures of its kind is attested by the difficulty which the designers experienced in determining the proportions of the ribs. An insight into the problem is obtained from the following statement by D. H. Andrews, president of the Boston Bridge Works, based on information in his possession.

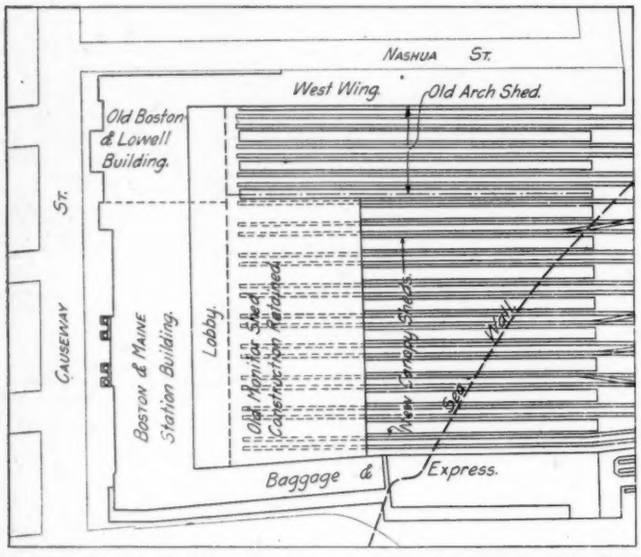
"The arched roof of the shed was built by the National



Under the Old Arch Shed Built in 1872

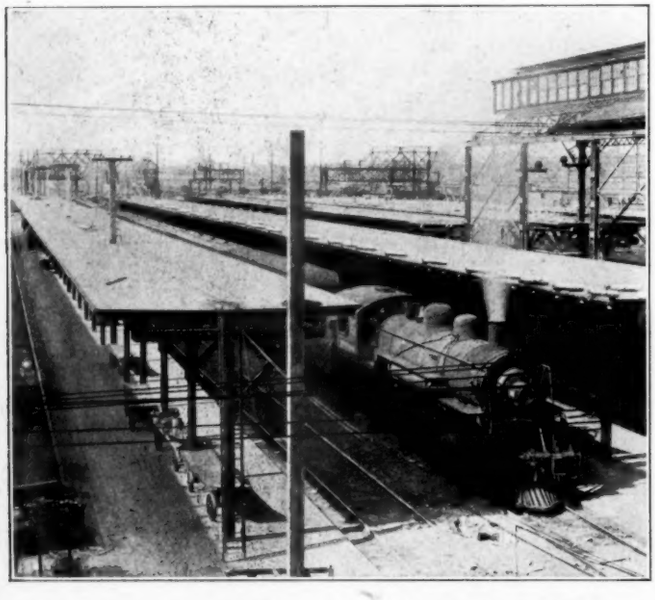
Bridge & Iron Works of Boston, Mass., and erected in 1872. There were at that time no published methods of computing the stresses in parallel braced arches and the contractors deduced the probable weight of material necessary for these arches from illustrations of the St. Pancras arched roof train shed which had been recently built in London. The braced

arches for the (old) Grand Central train shed in New York City were in process of erection before erection was begun upon the Lowell railroad train shed, but no information or advice as to computing the stresses could be obtained from the engineers of the New York Central. The graphical system of plotting the stresses in open truss work had not



Plan of North Station, Boston, As Now Arranged. The Old Sheds Covered All of the Area Now Occupied by the Canopy Sheds

then been practically developed and a study was made by the use of a catenary chain distorted by weights hung over sheaves with all possible friction eliminated. The calculations were all based upon the braced arches extending to the



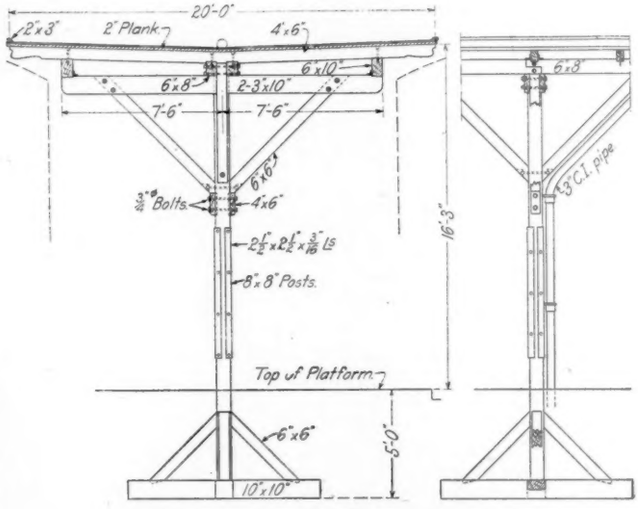
Type of New Canopies Built. A Portion of the Old Monitor Shed at the Right

foundation. The foundations of the arches were not calculated to resist the thrust at the bottom of the arches and an iron rod of sufficient size was carried under ground from one arch foot to the opposite foot. The material used was wrought iron of the strength of which no test can be recalled, but the stress in tension allowed under the calculation was 10,000 lb. per sq. in. and in compression considerably less. The iron used was asserted to have a tensile strength of from 48,000 to 50,000 lb. per sq. in. and the arches weighed about 13½ tons each."

Original Structure Extended in 1893

In 1893 the Boston & Maine built a new station building beside the old Boston & Lowell terminal, making such minor modifications in the old station as were required to permit of the use of the combined facilities as a single terminal which has long been known as the North Station. With the completion of this addition, the combined shed substructure was 472 ft. wide by 540 ft. long and covered 23 tracks, with a capacity of 184 cars (of the sizes prevailing in 1893). The train shed built at that time was of an entirely different construction than the old arch shed, consisting of nine spans of roof trusses, each covering two tracks except the one adjacent to the old shed which covered only one track. The roof trusses were supported on posts set in the center of each platform, making a spacing of 39 ft. transversely and 32 ft. longitudinally.

Photographs of the interior of this train shed appearing in the Railroad Gazette of May 25, 1894, showed that this



Details of the New Canopy Sheds

shed was of a gable roof construction with a very large proportion of the roof area in glass (reported to aggregate a total of four acres). This design was modified subsequently so that at the time that the structure was wrecked it consisted of a series of longitudinal monitors with flat roofs, the glass area being restricted to the vertical walls of the monitors. This is shown clearly in one of the photographs.

Prob'em in Removal of Large Arches

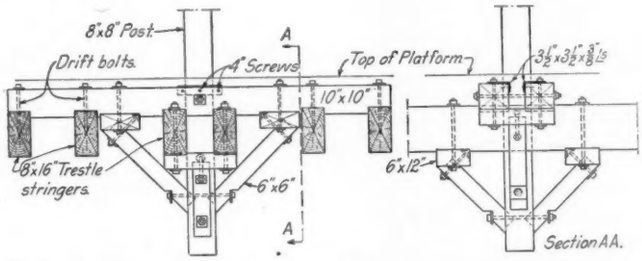
The recent alterations included the removal of all of the old arch shed except the three ribs nearest the headhouse and over the concourse, since the metal in these ribs was still in fairly good condition. In the case of the monitor type shed the removal was carried back to the last seven panels nearest the headhouse. These were also in good condition, owing no doubt to the fact that the tracks under this shed are used primarily for outgoing trains so that ordinarily the locomotives stood only under the outer end of this shed.

The wrecking of the old arches was undertaken first and represented the most difficult feature of the project, particularly because it was necessary to keep the tracks in this shed clear for use during the morning and evening rush hours each week day. Because of this demand on the use of the tracks under this shed, the wrecking operations were re-

stricted to the hours between 9 a. m. and 4 p. m. on week days and to regular working hours on Sundays when all six tracks could be released from station service.

The work was carried out with the aid of a special traveler designed to stand astride of the two center tracks and capable of being moved longitudinally on rollers and skids on the two adjoining platforms. This traveler supported a pair of stiff leg derricks on a platform 30 ft. above the track level and since these derricks had masts 40 ft. high and booms 70 ft. long, the ends of the derrick booms reached well above the top of the shed. After being relieved of the roofing and purlins and bracing, each arch rib was cut apart at the crown and at the haunches while each half was being supported by one of the derricks and as soon as the cutting had been completed, each derrick lifted down its portion of the rib. After the arches were taken away the lower portions of the ribs or uprights were removed by a bridge derrick car standing on the outer tracks.

The removal of these column portions of the arch ribs introduced one complication along the west side of the train shed owing to the fact that the west wing of the station, which was built after the arch shed had been erected, was supported in part by these columns. As a consequence, the



Method of Supporting the Canopy Posts Where the Platforms Are on the Trestle

east wall of this wing had to be largely rebuilt, providing supporting columns to take the place of the old columns removed. In addition the wall had to be remodeled so that it would support a canopy that was cantilevered from the side of this building as a shelter for the platform adjacent to track No. 23.

Owing to the fact that three arch ribs left standing adjacent to the headhouse extend to such a great height as compared with the new platform canopies, the great open space at the ends of the outer arch left the train concourse at the head of the platforms particularly exposed to driving rain or drifting snow from the west. Consequently, it was found necessary to cover the concourse with a continuous wooden shed designed to make suitable juncture with the canopies.

The removal of the trusses of the monitor sheds was less difficult. The two tracks under one span of this construction were released to the wrecking work at a time and a derrick car occupying one of these tracks lifted off the roofing construction and removed the trusses in turn.

Portion of the Train Sheds Over Pile Trestles

The construction of the new platform canopy offered no particular problem, except over that portion of the station where the tracks and platforms are supported on pile trestles over the waters of the Charles river. Here the posts supporting the canopy are carried by a pair of 8-in. by 16-in. stringers, forming a part of the trestle deck, but with the posts extending below the stringers for a distance of about three feet so that they could be adequately knee braced on the underside to secure the required stability.

The wrecking of the old structure and the construction of the new sheds were under the general direction of A. B. Corthell, chief engineer of the Boston & Maine, Boston, Mass., F. C. Shepherd, assistant chief engineer and B. W. Guppy, engineer of structures. G. L. Huckins, construction engineer, was in direct charge of the work, which was done under contract by the Boston Bridge Company.

Short Lines to Ask Court to Determine Status

WASHINGTON, D. C.

THE AMERICAN SHORT LINE RAILROAD ASSOCIATION is planning to go to the Court of Claims for the purpose of obtaining a decision as to whether the short lines relinquished by the Railroad Administration just prior to July 1, 1918, were or were not under federal control for the first six months of 1918. This was decided upon at the annual meeting of the association in Washington on May 19 after the members of the executive committee had held a conference with Director General Davis of the Railroad Administration for the purpose of determining their status. L. S. Cass, vice-president, who read the report of the committee at the meeting, said that the Interstate Commerce Commission had held that the period during which these roads were to be reimbursed by the government for losses during the period of federal control under Section 204 of the transportation act, was the 20 months' period beginning July 1, 1918, and it had refused to issue certificates covering the first six months of 1919. On the other hand, the Railroad Administration had refused to pay compensation to the roads for the first six months of 1918 on the ground that the roads had never actually been operated by the federal government. Mr. Cass stated that the director general had told the committee that he might lay their position before the President and ask for instructions, but he would prefer to have the organization join the Railroad Administration in going to the Court of Claims and ask for a ruling as to whether the Railroad Administration was responsible for the six months' period. Mr. Cass said that the director general was of the personal opinion that the short lines were under federal control during that time and that they had been discriminated against by the Railroad Administration, but that he desired a definite ruling from the court. The committee seemed to be of the opinion that the present director general intends to give fair treatment to the short lines and that there are reasons for hoping that the situation would be straightened out soon.

A Short Line Purchasing Agency

Action was also taken at the meeting in the direction of establishing a purchasing department of the association to handle purchases for such short lines as desired to take advantage of the opportunity on a co-operative basis. At the last annual meeting the president of the association was authorized to establish such a department, the necessary funds to be provided by borrowing from the general fund of the association. The association, however, did not have sufficient funds available and nothing had been done in that direction. A resolution was adopted authorizing the President to establish a purchasing agency under a plan by which the necessary funds could be contributed by the roads that desired to take advantage of the opportunity and urging the railroads not to make individual purchases until after they had consulted the purchasing agency to ascertain whether it could effect a saving. There was a suggestion that the agency should be created as a joint stock company, the stock of which would be held by individuals or individual members. It was stated that the Interstate Commerce Commission was inclined to regard the present purchasing methods of some of the short lines as extravagant and that it would look with favor upon a plan for effecting economies.

There was a considerable discussion at the meeting of the

serious effect on the traffic of the short lines in many communities and the competition of motor trucks and auto busses handling freight and passengers for hire on highways paralleling the railroads, which are taxed to sustain the highways while the competing motor truck lines are not required to pay adequately for their share of the maintenance of the highways. A resolution was adopted to be put in appropriate language later by the officers of the association, taking the position that automobile transportation for hire should be required to pay an adequate share of the taxes and be subject to some form of regulation which would require them to abide by published tariffs and regular schedules. Another resolution provided for a recommendation on behalf of the association to the Congressional committee having jurisdiction over federal aid to state highway construction that the federal assistance should be rendered only on condition that the users of the highways for the carriage of freight or passengers for hire be required to contribute proportionately.

Accounting Methods

Another point of discussion was the necessity for improvement in the methods of accounting, particularly in view of the necessity for having the accounts in shape to present claims to the Interstate Commerce Commission under Section 204 and in view of the closer scrutiny now being given by the commission to the subject of railroad expenditures. A letter was presented from Commissioner Eastman of the Interstate Commerce Commission, calling attention to the great difficulty experienced by the commission in handling the claims of the short lines because of the fact that so many of them have apparently failed to appreciate the necessity for keeping their accounts in conformity with its regulations. He called attention to the fact that it had been necessary to withdraw the commission's examiners from some of the roads until the accounts could be re-stated in accordance with the regulations, and urged the importance of a reform in the accounting practices of some of the lines, suggesting that they take steps to acquaint themselves with the commission's accounting regulations and particularly those pertaining to the destruction of records. A resolution was adopted under which the president of the association was authorized to take into consideration the establishment of an accounting department of the association to assist the roads.

A resolution was adopted opposing any general reductions in rates at this time, but expressing the opinion that there ought to be a reasonable readjustment of the existing rate structure after business has increased and the railroads get into a better condition.

The present officers of the association were re-elected, but it was decided to increase the membership of the executive board by adding a new Pacific Coast district and dividing the membership of the board among the four districts, Eastern, Southern, Western and Pacific, in accordance with the grouping used by the Interstate Commerce Commission in the general rate advance case. C. M. Oddie, G. F. Dietrich and D. M. Swobe were elected additional members of the board for the Pacific Coast district.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING showed a good increase during the week ended May 14, according to the weekly report of the Car Service Division of the American Railway Association. The total was 750,158 as compared with 843,145 in 1920 and 739,945 in 1919. This is a gain of 32,000 cars in a week and shows a gain over the corresponding week of 1919 almost for the first time this year. A large part of the gain as compared with the previous week was in the coal loading, which amounted to 161,782 cars.

The summary of the report follows:

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

SUMMARY—ALL DISTRICTS; COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. FOR WEEK ENDED SATURDAY, MAY 14, 1921

Districts:	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Merchandise L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1921	Total revenue freight loaded: Corresponding year 1920	Total revenue freight loaded: Corresponding year 1919	Received from connections: This year 1921	Received from connections: Corresponding year 1920	Received from connections: Corresponding year 1919
Eastern	1921	6,098	2,565	42,842	1,113	5,456	2,375	56,472	67,125	184,046	.....	.....	196,600	.....	.....
	1920	4,684	3,184	44,934	2,282	7,736	5,292	32,636	92,173	.....	192,921	185,364	.....	219,777	204,054
Allegheny	1921	2,151	2,548	52,143	2,538	2,143	4,058	43,298	46,798	155,677	.....	.....	96,762	.....	.....
	1920	2,106	2,924	49,461	5,209	3,297	6,646	38,785	66,613	.....	175,041	165,703	.....	127,785	119,080
Pocahontas	1921	134	76	23,714	53	1,370	19	2,643	5,348	33,357	.....	.....	13,659	.....	.....
	1920	140	96	16,953	700	2,181	333	175	10,290	.....	30,868	33,603	.....	19,570	16,887
Southern	1921	3,465	1,833	20,018	523	14,491	829	38,906	31,118	111,183	.....	.....	60,454	.....	.....
	1920	2,777	2,311	21,721	129	19,734	2,607	25,465	52,713	.....	127,457	108,531	.....	73,175	58,153
Northwestern	1921	8,390	6,941	4,429	598	15,011	14,219	27,474	30,265	107,327	.....	.....	41,819	.....	.....
	1920	8,853	8,696	6,833	987	17,928	32,705	20,642	43,469	.....	140,113	104,444	.....	59,712	45,719
Central Western	1921	9,332	9,481	14,692	167	4,448	556	30,389	31,335	100,400	.....	.....	48,760	.....	.....
	1920	8,171	11,755	17,546	421	6,127	3,055	22,548	45,156	.....	114,779	92,835	.....	68,846	54,428
Southwestern	1921	4,848	2,155	3,944	134	6,446	750	16,342	23,549	58,168	.....	.....	43,174	.....	.....
	1920	3,979	2,437	6,160	171	7,425	717	15,877	25,200	.....	61,966	49,465	.....	51,331	42,634
Total, all roads	1921	34,418	25,599	161,782	5,126	49,365	22,806	215,524	235,538	750,158	.....	.....	501,228	.....	.....
	1920	30,710	31,403	163,608	9,899	64,428	51,355	156,128	335,614	.....	843,145	.....	.....	620,196	.....
	1919	32,004	26,553	165,964	.....	51,660	42,562	.....	421,202	.....	.....	739,945	.....	.....	540,955
Increase compared	1920	3,708	.....	.....	.....	.....	.....	59,396	.....	.....	.....	.....	.....	.....	.....
Decrease compared	1920	.....	5,804	1,826	4,773	15,063	28,549	.....	100,076	92,987	.....	.....	118,968	.....	.....
Increase compared	1919	2,414	.....	.....	5,126	.....	.....	.....	.....	10,213	.....	.....	.....	.....	.....
Decrease compared	1919	.....	954	4,182	.....	2,295	19,756	.....	185,664	.....	.....	.....	39,727	.....	.....
May 7	1921	34,847	27,123	143,323	4,626	48,095	13,041	213,535	233,435	718,025	843,184	753,287	494,405	586,667	549,712
April 30	1921	34,426	29,909	145,010	4,659	84,554	7,725	213,792	237,922	721,997	800,960	752,362	489,073	545,205	554,350
April 23	1921	32,715	29,602	138,576	4,595	46,711	5,691	211,627	235,010	704,527	717,772	715,042	486,040	426,958	521,991
April 16	1921	33,367	26,530	135,658	4,365	47,909	4,941	214,082	237,044	703,896	601,695	706,012	472,107	317,933	525,277

L.C.L. merchandise loading figures for 1921 and 1920 are not comparable as some roads are not able to separate their L.C.L. freight and miscellaneous of 1920. Add merchandise and miscellaneous columns to get a fair comparison.

The freight car surplus for the week ending May 15 was 450,453, a reduction of 21,000 as compared with the previous week. Of the total 170,595 were box cars, or about 4,000 less than for the week of May 8 and 202,348 were coal cars, a decrease of 18,000 in a week.

A total of 309,971 freight cars, or 13.5 per cent of the total, were in bad order on May 1, according to the semi-monthly report of the Car Service Division. Of these 228,219, or 99 per cent, required heavy repairs and 81,752, or 3.6 per cent, required light repairs.

On the same date 18.8 per cent of the locomotives were out of service for repairs requiring over 24 hours and 5.4 per cent for repairs requiring less than 24 hours.

Selection and Maintenance of Office Equipment

Pennsylvania's Methods—Committee Must Pass on All Requisitions—History for Each Device

By D. T. Jones
Assistant to Purchasing Agent, Pennsylvania Railroad, Eastern Region.

WITH THE GREAT INCREASE in the use of mechanical devices in railway offices in recent years adequate supervision over the operation and maintenance of these devices and the intelligent selection of additional equipment of this character have become problems worthy of considerable study on the part of railroad officers. A carefully planned system of choosing, maintaining and supervising the utilization of these machines has been evolved by the Pennsylvania by careful study over a number of years and has been found effective in producing the desired results.

Mechanical devices have been used in the offices of this road for many years. They have assisted the clerical forces in the performance of their work by relieving much of the mental strain and have produced a more efficient and accurate service at a decidedly decreased cost. The use of mechanical devices in an office may be compared to the use of automatic signals, instead of hand motion signals, in the movement of trains. They promote safety and accuracy and save valuable time.

On a large railroad any important change in the methods of office work is fairly sure to disarrange the work and call for temporary additional expense and the Pennsylvania is no exception to this general rule. The introduction of mechanical devices has occasioned inconvenience in varying degree, but the final results in each case have been satisfactory. With the value of mechanical devices in office work once established the problem resolves itself into one of determining methods for selecting the most efficient machines to meet the requirements of each particular office and, after the machines are purchased, of supervising the utilization and maintenance of the equipment. Unless due care is taken in these matters the purchase price of the equipment will prove to be only the first installment of continued expense.

Committee on Office Mechanical Devices

The nucleus of the Pennsylvania's method of solving this problem is the committee on office mechanical devices. This committee is composed of officers representing the purchasing, accounting and operating departments and all requisitions for new equipment must be approved by it. Every requisition submitted to this committee must bear the signature of the general superintendent, if it comes from an operating office, or from the proper superior officer, if it is from other than an operating office.

Data relative to the need for the equipment must be furnished in accordance with the inquiry blank shown in Fig. 1, which is required to accompany all requisitions. Whenever necessary, a personal investigation is made by an expert on mechanical devices who makes reports and recommendations, first, as to the necessity of the purchase, and, second, as to what is the most efficient machine, at least cost, which will meet the needs of the office making the request. All requests for trial machines must be submitted to the committee.

Experience has proved that offices making requests for new equipment, or for trials of new equipment without the information which the committee has available, are often at the mercy of manufacturers' representatives who make attractive demonstrations. It is not an uncommon occurrence to have requests made for machines costing several hundred dollars, when a device costing much less is better adapted to the needs of the office.

Requests are often made for the machines of a special type,

PENNSYLVANIA SYSTEM

COMMITTEE ON
OFFICE MECHANICAL DEVICES
J. S. Donaldson,
Frank C. Hoff,
D. T. Jones,
Chairman.

GENERAL OFFICE, BROAD STREET STATION,
Philadelphia, Pa.

File 818
Broad 495

Dear Sir:—
In connection with requisition dated
Consignee:
Calling for

Please note numerical numbers under classification listed below—which is a cross reference to enumerated data on the reverse side, which must be submitted in detail prior to Committee action on your request.

A, Typewriters ..... 1—2—3—4—5—6—7—8—9—10.
B, Typewriter Adding.... 1—2—3—4—5—6—7—8—9—10—11—12.
C, Adding—Listing ..... 1—2—3—4—5—6—8—9—11—12.
D, Calculating ..... 1—2—3—4—5—6—11.
E, Dictating ..... 1—2—3—5—6—12.
F, Duplicating ..... 1—2—3—4—5—6—14.
G, Numbering ..... 1—2—3—5—7—13.
H, Registering Time ..... 1—2—3—5—14.
J, Pencil sharpeners..... 1—2—5.
K, Scales ..... 1—2—5—15.

An early reply will be appreciated, thus assuring prompt attention to your requisition.

Yours truly,
Chairman, Committee.

DETAIL OF DATA TO BE SUBMITTED FOR COMMITTEE CONSIDERATION.

1. Is it additional equipment?
2. a Is it a direct replacement, if so why?
   b Is it a re-arrangement to provide additional equipment for some other office? If so outline in detail, basing your answer as applying to the office receiving the additional equipment.
3. Its use: (a) Approximate hours in service daily (b) semi-monthly (c) monthly.
4. Character of work: (a) outline in detail giving samples or quoting form numbers; (b) show volume of each, daily, semi-monthly and monthly.
5. What are conditions in office affected? (a) Is request caused by an increase or a decrease in number of employees? (b) Total number of employees at present. (c) Number of employees using present equipment. (d) Number of employees who will use additional machines. (e) The number of devices similar to one requested.
6. Why is make mentioned preferred to others?
7. Style type preferred.
8. Size carriage; give dimension of largest blank to be used.
9. Do you need any special attachments?
10. For billing, reports or both? If the former, fanfold, single or double?
11. Adding or calculating capacity; number and size of registers desired?
12. Hand or electric? If latter give current and voltage.
13. Is movement to be consecutive, duplicate and repeat or otherwise
14. Automatic or electric?
15. Standard; mail or parcel post? The former, beam to 4 lbs., the latter spring to 24 lbs.; which is preferred?

Fig. 1—The Form of Questionnaire Sent by the Committee to Offices Ordering Mechanical Devices

equipped with extra attachments which are of little or no value to the office in question, and the elimination of these costly non-essentials effects a great saving in the aggregate. Tests showing the comparative merits of machines are studied by the committee and the knowledge gained is made available to all interested departments, thus enabling them to order more intelligently.

Mechanical Device Department

In addition to the committee on office mechanical devices, there is an interdepartmental branch of the purchasing department which is devoted exclusively to the work of purchasing and maintaining office mechanical devices. In this branch, there is a force of five general clerks, six repair men and one shipping and receiving clerk.

This office keeps an individual record of each device (Fig. 2), showing its original cost, the date of purchase, location and expense of maintenance, together with full particulars leading up to its being acquired, transferred, etc. This record shows its full history up until the time when it is discarded. An alphabetical cross file (Fig. 3) is also in use which shows the full mechanical equipment at any town or city on the system collectively by offices, divisions, and grand divisions. In this manner any machine can be identified if its serial number is known; or, if the location is given, the number is obtainable. The information thus available enables those in charge to effect large savings each year.

The purchasing department requires a receipt for all equipment furnished, together with a statement of the date of installation. To each individual machine card a number is assigned. Under this number the papers leading up to the purchase of the device and the acknowledgment of its receipt are filed, as well as correspondence on repairs. In this way the machine cards give the history of each machine. All correspondence pertaining to it is segregated in one folder under a given number.

When the mechanical devices office receives a requisition for repairs to a machine, the record card for that machine is referred to and the cost of former repairs is noted. If the cost of repairs is abnormally large the fact is evident and improper care or faulty construction is disclosed. If the repair work is to be performed by an outside concern the order number for the work is placed on the card and the possibility of duplication of the order is obviated.

All bills for repairs to machines are likewise checked with the individual machine cards and a record taken of the amount of each bill. This effectually prevents the payment of duplicate bills and allows the assignment of order numbers to bills which are presented without specifying order numbers. The resultant record is an accurate figure on the maintenance cost of each machine.

In cases where the cost of repairs will probably exceed an arbitrary maximum amount, an estimate on the cost of repairs is required. Records of these estimates are kept and bills for repairs compared with them in order to provide against overcharge. The cost of repairs made by the department's own

Equipped with Make_____ Serial No._____
Model No._____
Style Type _____

		LOCATION	DATE	REMARKS
Purchased	From			
Req'n or	To			
Number	From			
Net Cost	To			
Order No.	From			
REMARKS	To			
	From			
	To			
	From			
	To			
	From			
	To			
	From			
	To			
	From			
	To			

RECORD OF MOVEMENT A/C REPAIRS

	FIRM	DATE
To		
From		
To		
From		
To		

RECORD OF REPAIRS, ETC. R. R. FILE No

REQUISITION	CREDIT ALLOWED	MONTH	YEAR	AMOUNT CHARGED

REQ'N NO.	ORDER NO.	DATE	COST	

Fig. 2—One of These Cards Is Used to Keep the Record of Each Machine. Insert Shows Reverse Side of Card

MECHANICAL DEVICES LOCATED AT_____
_____ BUILDING _____ DIVISION

MAKE	MODEL	SERIAL NO.	REMARKS	MAKE	MODEL	SERIAL NO.	REMARKS

Fig. 3—The Form Used to Keep a Record of All Machines in Any Office

workmen is recorded on the individual machine cards the same as if the repairs were made by outside concerns. The department keeps in stock a number of standard machines which it is prepared to loan to offices with machines undergoing repairs when it is found necessary to do so.

Requisitions for New Equipment

At meetings of the committee on office mechanical devices minutes are kept and after the meeting these minutes are written up. The approved requisitions are noted from the minutes and orders for the machines are placed. A chronological record of these orders is kept, giving the order number, consignee, purchasing agent's requisition number and specifications. As soon as the order for a machine is placed, an individual machine card is made out for it, leaving blank the spaces provided for its serial number and cost. Later the serial number and cost are filled in, a record taken on an alphabetical card and the individual machine card is then filed under its number. Bills for new machines are compared with the orders to assure correct prices and prevent duplicate billing. Fig. 4 is the form of letter used by the chairman of the committee on office mechanical devices to inform any office which has placed a requisition for new equipment that the order has been placed.

PENNSYLVANIA SYSTEM
COMMITTEE ON
OFFICE MECHANICAL DEVICES
GENERAL OFFICE, BROAD STREET STATION.
J. S. Donaldson, Philadelphia
Frank C. Hoff,
D. T. Jones,
Chairman.

File 818—
Broad 495

Dear Sir:—

In connection with your requisition No. dated calling for
Consignee:
Your request was approved and the Purchasing Agent is placing order covering; please note paragraph Nos. and 4, advising the Purchasing Department accordingly.

No. 1. On receipt of new equipment, replaced device. should either be surrendered to the manufacturer's representative or forwarded to

No. 2. The Purchasing Department forwarded from stock on the following to apply:

No. 3. Replaced machine should be forwarded to Mr. D. T. Jones, 33 N. 17th Street, Phila., Pa., marked a/c memo. either by Adams Express prepaid, passenger train (under valuable sticker) or messenger, for credit.

No. 4. IT IS IMPORTANT that you inform the Purchasing Agent PROMPTLY relative to the date of delivery, serial and model number of new equipment received; also advise fully regarding any transfers emanating therefrom, for the correction of his records.

Yours truly,
Chirman, Committee.

Fig. 4—Form of Letter Used by Committee to Inform Office of Approval of Requisition for New Equipment, Giving Disposition of Old Machines

The bills approved each month are classified according to type, model and manufacture and totals of purchases by number and cost are kept. This report enables those in charge to know exactly the progress that is being made in the acquisition of additional equipment. A detailed running report of the total number of each device is kept by making additions to and subtractions from the total each month.

Replacements

When requisitions for replacements are submitted, they are compared with previous records of similar requests from the same office and other offices. When replacements are made with new machines the more important offices are favored and the less important offices receive rebuilt machines. Under no circumstances are old machines disposed of without positive assurance that they have outlived their usefulness. All replaced machines are inspected by a company representative in order to determine whether they should be disposed of or repaired for further utilization.

Stocks

The company keeps a supply of standard machines on hand. The devices in stock are, as a rule, used machines made available by the return of surplus equipment, replacements with new machines or the adjustment of misfits. When a machine is received in stock it is rebuilt, if its condition warrants the expense.

If it has outlived its usefulness, it is traded in to the manufacturer on account for a new machine, or, should the parts be of greater value than the trade allowance, it is junked and the parts used for making repairs to other machines. During the year 1919, 361 rebuilt machines were furnished on requisition, obviating the purchase of new equipment.

The fact that a supply of used machines is kept in stock available for loaning where they are needed effects a great saving in equipment rental costs each year and has enabled the department to furnish machines on short notice when, in times past, there was a shortage of machines in the stocks of the various manufacturers. As an instance—the coal strike necessitated the inauguration of a coal bureau and, in less than a week, this office was fully equipped with 35 used typewriters which had been rebuilt by employees of the company. The ability to furnish equipment on short notice without depending upon outsiders insures the uninterrupted working of offices which would otherwise be impossible. Furthermore, the concentration at one place of equipment unfit for further service makes it possible to dispose of it to the best advantage. The allowance made by manufacturers for machines traded, is carefully watched and the machines dis-

Machine No.: Model No: .....
Returned From: Memo No: .....
Date: .....
Reqn. No: .....
Repairs: ..... Loan: ..... Place in Stock: ..... Credit: .....
To be Examined: .....
Remarks: .....
.....
.....
.....
Date Received: .....

(Reverse Side of Card)
Purchasing Department Repair Report:
Cause of Trouble: .....
.....
How Remedied: .....
.....
.....
New Farts Used..... | Repaired by:.... Time:...
..... | Shipped: .....via.....
..... | To: .....
..... | .....
..... | .....
..... | .....
Total Cost of Parts: ..... | Acc't of: .....

Fig. 5—Card Used to Check Shipment and Receipt, Repairs and Cost and Final Disposition of Machines

posed of to the one who offers to allow the company the highest credit for the used machines.

Repairs

The extent of repairs to machines by the department is limited somewhat by the size of the force and the available facilities. Some of the work done in this department may give a better idea of its effectiveness: Typewriter cylinders are recovered at a cost of 50 cents, representing a considerable saving over the purchase of new cylinders which cost from $2 to $3. Broken main frames of typewriters are welded at a total cost of $7 or $8 instead of purchasing new ones at a price of $20 or $25 each. At least 80 per cent of the cost of overhauling and repairing this equipment is a labor charge, and the greater part of the work of dismantling, cleaning and assembling does not require great mechanical skill. By employing junior repairmen at relatively low wages the company is able to effect a considerable saving in cost over the high rates paid to outside concerns for this work.

In order to facilitate the giving of shipping directions on machines and to insure prompt and efficient handling of them when they arrive, a system of records is kept as shown in Fig. 5. This card is filled out in triplicate as soon as directions for shipping a machine are given. The memorandum under which these orders are issued is numbered and the office which ships the machine affixes this number to the box in which the machine is packed. When the machine arrives the receiving clerk notes the memorandum number and refers from it to the form, Fig. 6, which shows exactly what is to be done with the machine. On each of these cards, Fig. 6, the date of receipt is then stamped. One card is then filed under the memorandum number, another is sent to the repair department for its work file and the third is attached to the machine. When the machine is repaired by the department's repairmen, the reverse side of the card on the machine and its duplicate in possession of the repair department are filled out. This card is then sent to the department office and the cost of repairs and other data are taken from it and filled in on the individual machine card and the repair requisition and all the correspondence connected with the transaction are properly filed. This method has been found to provide an excellent check on the receipt and disposition of equipment.

The Northwestern Pacific's Safety Organization

By William S. Wollner

General Safety Fire Prevention and Welfare Agent, Northwestern Pacific, San Francisco, Calif.

PRIOR TO THE PERIOD of federal control, the responsibility for the safety of employees and patrons of the Northwestern Pacific was vested in the division superintendents and in the heads of the various departments. During federal operation, however, a safety department was organized under the uniform plan recommended by the Safety Section of the United States Railroad Administraion. This organization, as inaugurated in September, 1918, consisted of a general safety agent, a safety supervisor, a general safety committee and four subordinate safety committees. The general safety agent, the safety supervisor and all the members of the five committees were appointed to their positions by the general manager of the road; the "officer members" permanently, and the "alternating members" for a period of six months.

The alternating or employee members selected in this way were the local chairmen of the various brotherhoods and other employee organizations. Fortunately it happened that the committee personnel which this election produced was of such high character that the safety organization functioned as it was intended. At the same time it was realized that this method of choosing would eventually produce a different personnel not fitted to secure these good results. The fact that members of the safety committee were selected by the management might lead the employees to look upon this organized effort for safety as a scheme adopted solely in the interest of the company. Furthermore, the selection of organization chairmen or other organization representatives might easily result in the safety committee meeting assuming the character of a "grievance conference."

Realizing that the securing of increased safety is very largely a problem of the human element and that, in consequence, the responsibility must be placed primarily upon those most interested, the Northwestern Pacific, in January, 1919, issued the following statement to its employees, outlining a new plan:

"The term for which employee members of our various safety committees were elected will expire February 28, 1919.

"In replacing the retiring committeemen, the safety department wishes to experiment with a plan which should create committees that will be truly representative of all the employees; if this plan operates successfully, its use will be continued in the future.

"The method to be followed in this election is: Each retiring safety committee member will nominate two men of his own craft, one of whom is to be elected as his successor. These nominations are to be made immediately and ballots will be printed, carrying the names of all nominees, and a space where the name of any other person may be written in.

"A ballot will be handed to each employee with his pay check for services rendered during the first half of the month of February. Each employee should indicate with an "X" or by writing the name on his ballot of the man he wishes to represent his craft on the safety committee, and hand the ballot to the retiring committeeman who has represented this craft. The ballot will carry nothing to indicate by whom it was cast. Retiring committeemen will canvass the ballots and furnish the names of their duly elected successors to the chairmen of committees."

This method of electing safety committee members proved so successful that upon the expiration of the term for which they were elected, that is to say in February, 1920, a similar election was held. A further change was made at this time by having each retiring safety committee member nominate three fellow craftsmen instead of two. By another ruling, ballots were forwarded to safety committee secretaries instead of being handed to the retiring committeemen.

The results of the third election that this road has held for safety committee members has just been announced. This last balloting, it is believed, shows a further improvement. Publicity was given to the election several months before it was held through the medium of the company's bulletin. It was desired that the interest of every employee be stimulated, since it appeared likely that the employee who took an interest in the election would also be concerned with the general safety program. Each safety committee member who had been elected a year before by the votes of his fellow employees was asked to nominate three fellow craftsmen, one of whom would be elected as his successor. The nominations were made to the safety committee chairmen who in turn forwarded them to the general safety agent. In the previous election, the names of all candidates had been printed on the ballot, but some of the employees called attention to the possibility of men voting for other than members of their own craft. They pointed out, for instance, that if enginemen and firemen were interested in the election of a certain conductor, they might place him in office regardless of the desire of the majority of the other conductors. It was decided, therefore, that in this election the ballots distributed among the members of each craft should contain only the names of the candidates from that craft.

The large proportion of our employees who voted in this election indicated the real interest that they are taking in safety matters in general. At the present time the Northwestern Pacific is instituting a special campaign to bring before safety committee members their responsibility for the prevention of accidents caused by unsafe practices, as well as those caused by unsafe conditions.

It is believed that the realization by the individual safety committee members of the fact that he has been elected to office by his fellow craftsmen as their representative increases his sense of responsibility for their safety.

Railroad Hearings Before Senate Committee

Testimony by A. H. Smith and Howard Elliott Regarding Causes for Poor Financial Showing of the Railroads

WASHINGTON, D. C.

A. H. SMITH, president of the New York Central Lines, concluded his statement before the Senate Committee on Interstate Commerce in the railroad inquiry on May 23 and was followed by Howard Elliott, chairman of the Northern Pacific. Mr. Elliott began with a general statement, followed by a statement applying more particularly to the Northern Pacific. He said in part:

Transportation Act Not Responsible for Present Conditions

There is much discussion in this period of business depression and deplorable results from the operations of the railroads about the recent Transportation Act and whether it is a wise or unwise measure and can accomplish what was expected.

Final judgment of this act now would be like judging some great manufacturing plant before it had been furnished the raw material to be used. The Transportation Act was to apply to something like normal conditions and was not intended to be a "cure-all" for a world-wide depression of unexpected severity in all kinds of business.

The act did not undertake to create commerce; its object was to insure to the public adequate means of transportation and to this end secure the safety of securities of sound railroads; to protect the existing transportation machine and to encourage its development to meet the needs of the country; to regulate the transportation of commerce by railroads in such a way that those engaged in that business, either owners or employees, should, if possible, have a fair return for services rendered to the public.

One provision of the act provides that until March, 1922, the rates shall be such that, as nearly as may be, there will be a return of 5½ per cent or 6 per cent on the fair valuation of the railroads, but the act did not and could not insure the business necessary to earn such return.

If the policy of extreme regulation of the railroads by the government is to continue, then this particular provision of the act is of great importance.

The Transportation Act and the principles and rules contained therein are not responsible for the present unfortunate disappearance of railroad net earnings. The Congress, the public, the railroads, and the labor organizations should do all they can to help those upon whom the very great responsibility is imposed of administering the act.

Two boards, with vast powers over the railroads, are set up; one dealing with rates and regulations affecting commercial questions, and the other with wages and rules about wages and working conditions.

If those two powerful boards, one in Washington and one in Chicago, with no close relations between them and with no common authority over them, short of the Congress, and with their large membership, should find that the questions submitted to them are so numerous that they are unable to act promptly and decisively, then no matter how good the fundamental principles may be, there is danger that the full benefit of the law will not be obtained.

I know that it is the earnest desire of the officers of the railroads to cooperate to the best of their ability, both individually and collectively, with the commerce commission and the labor board, to make the administration of the act effective and to obtain the results intended when the act became a law. Much has already been done in this direction, and the managements of each road are all the time hard at work on the home road, and through various associations of executives, operating and traffic officers, working together and with the commission and labor board to improve results and obtain, to as great degree as practicable, for all roads what the law calls for—"honest, efficient and economical operation."

A railroad is a complicated and delicately adjusted manufacturing plant and its product is transportation, manufactured daily and in countless forms, and under widely varying conditions. Its product, however, must be used as produced; it cannot be stored up for the future. Other people are manufacturing other commodities; generally they can raise their prices in prosperous times and can store their products in poor times for future delivery, or close their plants entirely; the railroad has not been allowed to raise its prices to the extent that the manufacturers and producers have and it has nothing accumulated from the large business of the past few years to care for the present period, and it cannot close down its plant.

It is self-evident that the railroad, manufacturing transportation, cannot, on a falling business, long continue to be a solvent enterprise, if it cannot, as other manufacturers do, have some control of its income and outgo and pay wages substantially on the same basis as may be paid by other employers in similar territory. This is not the case to-day and the inability of the railroad to adjust promptly its costs to meet depressed business conditions is the chief cause of the present situation.

Results on Northern Pacific

During the past 20 years, about $430,000,000 has been spent by the Northern Pacific for additions, improvements, betterments, equipment and new lines, so as to make a better transportation machine for the development of the country. Here are statements showing the general financial data for the Northern Pacific for the years ending June 30, 1912, 1913, 1914, 1915, 1916, 1917, and for the calendar years ending December 31, 1918, 1919 and 1920. Figures for the average of the three years ending with June 30, 1914, are given, also for the three years ending June 30, 1917, and so-called test period.

	1st Period	2d Period	1919	1920
Operating revenue.	70,111,933.62	74,860,736.16	101,474,988.80	111,872,097.43
Operating expenses	43,022,796.93	41,599,356.84	78,672,509.37	100,983,874.19
Operating ratio....	61.36	55.56	77.53	90.26
Transportation ratio	31.86	29.05	37.71	43.29
Net Ry. op. income	24,667,774.81	30,196,329.98	15,104,113.74	6,737,147.87
Income balance after interest and 7 per cent div....	3,097,689.17	6,854,944.36	*6,597.407.53	*15,741,260.00

*Deficit.

This statement shows that the operating revenues of the property increased from the first period, $70,111,933.62, to $111,872,097.43 for 1920, but the ratio of operating expenses to earnings increased from 61.36 per cent to 90.26 per cent and the ratio of transportation expenses to revenues increased from 31.86 per cent to 43.29 per cent. The result was that while the property, for the period ending June 30, 1914, paid all of its expenses, taxes, interest, a 7 per cent dividend and had $3,097,689.17 left, in the year 1920, with an increase of over $41,000,000 in gross revenue, the expenses had so increased that it failed to meet expenses, interest, taxes and dividend charges by $15,741,260.

The figures also show that the efforts of the company, its officers and men, to improve operating methods, resulted in a reduction of the operating ratio in the second or test period to 55.56 per cent for all expenses, and to 29.05 per cent for transportation expenses (an improvement over the first period) which, however, under government wages, methods, etc., increased to 77.53 per cent and 37.71 per cent respectively for 1919, and to 90.26 per cent and 43.29 per cent respectively for 1920. This very great increase in the amount of each dollar of operating revenue used in operating expenses was, for reasons already fully explained by the previous witnesses, beyond the control of the railroad operating officers.

In the case of this particular property, the figures for units of service produced from the use of tracks, cars and locomotives show, in the main, a steady improvement, as per the following figures:

	Test period	1919	1920
Net ton miles per road mile.....	1,218,310.	1,310,924.	1,364.961.
Av. gross tons loco. mile.....	1,366.7	1,347.6	1,350.5
Av. tons per loaded car mile.....	23.9	26.7	27.3
Per cent of net ton miles to gross	46.66	48.09	48.74
Per cent of loco. miles to train miles	111.41	113.17	113.04
Per cent of loaded to total car miles.	72.45	71.20	70.58
Av. miles per frt. car per day...	26.6	27.5	32.9
Net ton miles per car day.....	461.	522.	633.7

It will be noted from this table that the amount of tonnage over each mile of track, the loadings of engines and of cars, and the movement per day of cars were better in 1920 than in 1919, or than in the test period, clearly showing that if wages, working rules and prices of coal and other materials necessary to carry on the business had been on the same basis as in the test period, the costs would have been lower in 1920 than in the test period.

Effect of Increase in Expenses

Statements are herewith submitted in considerable detail showing various units measuring the operations of the railroad for

the test period for the years 1918 and 1919, and for the year ending December 31, 1920. These statements show that the physical use and operating performance of the railroad in 1920 was equal to, and in many items better than during the test period, and the same compared with 1919. This shows clearly that good use was made of every part of the plant, as already explained in the figures for density of traffic, car loading and movement, train loading, etc., and indicate that the increases in expense do not come from mismanagement, but from higher costs for fuel and materials, increases in wages, and the disturbing influences generally of the war affecting, as they did, the morale and general effectiveness of large bodies of men in all walks of life.

The following figures are interesting on this point:

	Test period	1919	1920
Total expense per mile of road	$6,408.61	$11,934.71	$15,178.04
Aver. cost maint. of way per mile of main track	1,293.96	2,187.32	2,806.02
Operating revenue per train mile	3.54	4.79	5.11
Operating expense per train mile	1.97	3.71	4.61
Net oper. revenue per train mile	1.57	1.08	.50

Number of Employees, Hours Worked, and Compensation

In 1917, the average number of officers and employees managing, maintaining and operating the road was 31,887; they worked 1,312,420 days, and 91,710,810 hours, and received $35,877,879.

In 1919, there were employed 33,700 officers and employees, who worked 1,286,092 days and 80,886,575 hours, the compensation amounting to $52,605,395.

In 1920, the average number of officers and employees was 35,553, working 1,371,933 days and 86,058,373 hours, receiving therefor $66,503,794; on the basis of the wages fixed by the Labor Board and applied to the entire year, 1920, their compensation would have been $69,975,740, very nearly double the amount of money for a smaller amount of time worked than in 1917.

Some Reasons for Decline in Net Revenue

The remarks already made and various statements submitted have a bearing on the first, second and fourth questions of Senate Resolution No. 23.

Speaking for the Northern Pacific and considering the first paragraph of the resolution, the increases in expenses and the consequent decrease in net earnings are due almost entirely to causes beyond the control of the management, and what is true for the Northern Pacific is true for other roads; namely, to

The increases in wages brought about by war conditions and by orders of agencies of the United States government.

The more general application of the 8-hour day, greater payments for punitive overtime, changes in rules and working conditions, all as a result of governmental action and orders; and also to the general disturbed morale incident to the upheaval of the world war.

The increase in prices (over which the carrier could have very little control) of fuel and materials due in part to higher wages paid for the production of said fuel and materials, and to the excessive demand for them during the war period and for some time after.

The increases in taxes, affecting all business and individuals.

The increase in the volume of passenger train service given in 1920 as compared with 1919, because of the desire of the railroad managements to restore, in part, the unexcelled service given prior to the war.

While it is true advanced interstate rates were authorized, taking effect September 1, such rates were only in effect for one-third of the year in interstate business, and on intra-state business were in effect less than one-third of the year in all of the states traversed by this company's lines, and in one state, namely, North Dakota, the new rates are not in effect to-day. Therefore, the increased revenues derived from these new rates were not anywhere near sufficient to offset the increase in expenses due to the causes already given, or to produce the result anticipated.

The wage award of July 1, retroactive to May 1, increased wages for four months $3,818,033, for which there was no corresponding increase in rates.

Maintenance of way increased in 1920 over 1919—$4,780,000. This was brought about by the following conditions:

The railroad of the Northern Pacific was under-maintained during the period of federal control and sustained itself, in part, because of the very high standard of maintenance in years gone by and the unusually good condition in which it was when it was turned over to the Government on January 1, 1918.

The wages under the Labor Board's award, retroactive to May 1, 1920, were on a much higher basis than in 1919, together with time and a half for overtime for all maintenance of way employees.

The cost of much material used in 1920 was, on the whole, higher than in 1919.

When the properties were turned back to the companies, they had a very proper and praiseworthy desire to restore them as quickly as possible to a condition to serve the public thoroughly well, on the theory that in the autumn of 1920, there would be a very good business, and it was most desirable to have maintenance work well out of the way, thus permitting the maximum attention to the moving of the business. For these reasons, maintenance work was pressed vigorously in 1920.

Effect of War Conditions on Efficiency

As to paragraph 4 of the resolution about efficiency. It is proper to say that the officers of the railroad of every rank were, during the war and the period of federal control, as patriotic and as energetic and helpful in doing their allotted tasks as any class of men in the United States. They were, however, disturbed over a change in their relation to the properties where many of them had spent their lives; they did not know what their relations were to be in the future; their powers and responsibilities were changed and in some cases reduced; decisions that they formerly could make promptly were made at some point off the road or in Washington; discipline was weakened; and there was an increasing tendency to long-distance management, and the affection and pride of the officer in his particular road was weakened by telling him he did not work for that road but for a part of a United States system of railroads. In an effort to save a relatively small amount in supervision, men were given more territory and spread out too thin.

All of this had some effect on the mind and courage of the officers, and we all know that suspense and uncertainty have a disturbing effect in efficiency. But in spite of it all, the officers of the railroads did splendid work during the period of federal control and they are "on their toes" now to get the best results they can since the properties came back to the owners.

In addition "leadership," so important in any undertaking, was changed and men looked to the officers on their division or on their road to a much less extent than formerly, for reward for good work or punishment for bad. They rather looked to some more distant person or board in Washington and to the head of their union.

The relation between the men and management, which should be close, co-operative and friendly, without interference from outside if the best results for the country are to be obtained, was not so close as in pre-war times.

There was less interest, there was more slack and careless work and not as high efficiency as prior to the war. This condition was not peculiar to the railroad employee; everyone knows that it existed in the household, the store, the office, on the farm, in the factory and the mine, as well as on the railroad. It had a marked effect on the cost of everything and on the cost of maintaining and operating the railroads. It is difficult to measure that cost in dollars and cents and operating officers have varying opinions in accordance with their personal experience and the part of the country in which they worked. Generally the conditions were better the further away you got from Washington, and from those manufacturing and shipbuilding regions where the necessity of the war required that production be speeded up regardless of costs.

Estimates have been made that efficiency at times was only 50 per cent of the best pre-war record, and from that up to 65 per cent, 75 per cent, and 80 per cent, and in some cases were 100 per cent, but the consensus of opinion is that there was a noticeable reduction on the whole.

Officers and men since federal control have slowly been getting together again and the disturbed conditions developed during the war and federal control are improving, and began to change for the better in the autumn of 1920, when it was evident that the man wanted the job rather than the job the man.

Effect of Increases in Rates

The third paragraph of the Senate resolution relates to the reasons for the fall in business and the influence of increased rates in causing such fall. I have made many inquiries of all kinds of people during the past few months about this question because the decrease in the volume of the business on the road I represent has been as severe as on any road. The almost universal opinion, and my own judgment coincides, is that the increase in rates has been a negligible element in the decrease in the volume of business.

The reduction in the volume of business, in my judgment, results from many causes entirely distinct from the increase in freight rates. Merchants and manufacturers had accumulated stocks of goods at the end of 1919 and in 1920, bought at high prices, and they were naturally slow in reducing prices. The retailers were in the same condition; orders for foreign and domestic goods were cancelled; raw materials were not moving because no one would buy them, until it was evident that stocks of finished goods already on hand could be disposed of and until there was a demand for new stocks. The reaction from the extravagance of the war, the increasing unemployment, the fall in the price of farm products brought sharply to the attention of thousands that it was necessary to save. Buyers, hoping that

prices would fall, were waiting until they thought the bottom was reached and there was a widespread buyers' strike.

The aftermath of the war, the inability of Europe, one of our best customers, to buy and pay for goods, the disturbed condition of foreign exchange, the long delay in settling the war, and the question of the German reparation are all very vital factors in the world situation which affects the United States most seriously.

Making a general reduction in freight rates will not help solve the present complicated, economical and psychological conditions in this country, but will reduce still further the ability of the railroads to survive and become buyers themselves of those articles which, when they are prosperous, they use in such large quantities.

In saying this, I do not mean that no rates should be readjusted, because there are some now in process of adjustment, but I believe it would be unfortunate to give the impression at this time that the railroads can be sustained, as contemplated by the Transportation Act, and, at the same time, make any general reductions in freight rates, until it is evident that expenses have been reduced enough to justify such reduction.

It should be remembered that prior to governmental control the general level of rates in the country was not enough to sustain the carriers and to permit them to expand and take care of the growing business of the country. The director general recognized this and in 1918, attempted to bring his income up to his outgo by increasing freight and passenger rates, but the increase in expenses during federal control overtook the increase in rates, as has already been shown by the figures submitted.

Prior to the end of federal control, the director general was urged repeatedly to bring the earning power of the roads back at least to the 1917 basis when the government took them over, by increasing the rates as he alone had the power to do; but he declined, claiming it was better to make up deficiencies in railroad operations from the general funds of the Treasury, although he did take action in regard to the working rules which still further increased the cost of operation. So the railroads were turned back with their earning power practically annihilated and nowhere near the basis of 1917 which, in itself, was too low for the general health and growth of the transportation machine.

There was no "inflation" of railroad prices to a point where any large profit was received, as was the case with many industries; in fact, no profit was made at all in 1918, 1919, and 1920, so there is no basis for "deflation" of railroad prices or rates at the present time. Rather there is a necessity for holding them where they are until the country finds out what will be the results on the railroads under the new Transportation Act and the orders of the Commerce Commission and the Labor Board.

The Transportation Act recognizes the possibility that rates may produce earnings that are too high in the judgment of the commission, by providing in such cases that any excess shall be disposed of partly to the owners for certain defined purposes, and partly to the government, to be administered for the common good. To-day, considering the sore distress of the railroads and the fact that very few of them are earning enough to more than pay expenses and taxes, and many not even that much, the sound national policy would seem to be one of liberality to the roads in their rate structure, rather than parsimony, because, as already stated, any excess earnings are disposed of by law. In addition, the power at all times rests with the commission to reduce rates if and when the rates are earning enough to comply with the principles laid down by the Transportation Act.

Development of Regulation

The gradual development of the law since 1887 has been in the direction of encouraging and protecting the buyer of transportation and safeguarding him from possible injustice, extortion and unwise financing on the part of the producer. Admitting for the sake of argument that this course was necessary, the time has come when the producer of the transportation must be protected and encouraged or he will be unable to furnish the transportation needed by the buyer at any price.

The Transportation Act is a protecting and encouraging measure and reflects a growing public opinion that legislation has gone too far in reducing the earning power of the carriers. The recent repeal of the full crew law in Pennsylvania is another indication of this.

I believe the Transportation Act should be given a fair trial under more normal business conditions than exist today, and that before making changes it should have such fair test.

Regulation of private corporations serving the public is necessary, but I believe that the best results can be obtained for the public by allowing the individual, in any kind of business, the maximum freedom of action consistent with due protection of the public interest.

The Hepburn act in 1906 took away from the railway owner and manager the right to make effective the price at which he should sell his service to the country. The Commerce Commission found itself subjected to pressure of 100,000,000 buyers of transportation who thought that their interest was in getting the lowest rates, regardless of the effect on the seller of the transportation. The influence of the great body of buyers has been more powerful than that of the smaller number of sellers and the general tendency has been towards rates entirely too low to maintain the railroads properly, pay satisfactory wages, and make such return to the owners that they can continue in the business and increase their plants.

Congress recognized this situation in the rule of rate-making in the new law which gives the commission instructions and support in allowing rates that will enable the owner to carry on the business and furnish the necessary transportation to the public. With a more normal volume of business it is reasonable to believe that this principle in the law will produce the results anticipated.

Congress also in passing the act reflected the opinion of the country that it wanted its railroads owned and managed by private individuals. Imposing this responsibility upon the owner necessarily carries with it the idea that he shall be allowed reasonable freedom to act so as to produce the results expected from him. In interpreting and administering the law, it is certainly a sound policy to give the owner, who is responsible for the results, the maximum of freedom, consistent with the public interest, so that the undoubted talents and ability of the American business man can be exercised.

I believe that the tendency of the laws and the administration of the Transportation Act and, if it should be found necessary, any new legislation should be along the line of permitting the owner and manager to utilize to the highest extent, compatible with the public interest, his vision, enterprise, judgment, initiative and skill.

In creating our railroad system the work was done through the courage, brains and money of the individual man who developed a wonderful transportation machine with the lowest rates, the best service and the highest wages of any railroad system in the world. I believe the owner and manager can continue to do this if his activities are not curtailed too much.

The wage cost for operating a train one mile, Mr. Elliott said, was $2.92 in 1920 compared with $1.47 in 1917 and $2.39 in 1919 while if the wage increases made by the Railroad Labor Board in last July had been in effect the entire year, the average cost per train mile would have been $3.07.

The cost per mile run by all freight locomotives in February last was $124.46 compared with $96.93 during that month the previous year and $59.42 during that month in the test period, 1915-1917. Cost per mile run by passenger locomotives was $71.21; $58.56 and $34.61 during those periods.

"I give these figures," he continued, "because they show that increase in locomotive costs in 1921 has not been due to poor management or the inability of the locomotives to handle the business, but is due to higher cost of fuel and materials, changes in working rules and conditions and to increased wages."

Mr. Elliott called attention to the "very significant effect caused by the increase in the prices of materials and wages, the rules in the so-called national agreements and the general disturbing effect of the war" on the cost of repairing freight cars and locomotives. This together with the financial condition of the carriers, he said, has resulted in an increase "to beyond the danger point" in the amount of equipment out of repair because the carriers have not got the money with which to make such repairs.

Approximately 13.8 per cent of the cars owned by the Northern Pacific are in bad order, he said, of which about 4,000 require heavy repairs, requiring approximately $1,500,000 to repair. On April 15, he said, statistics showed about 19 per cent of the locomotives on the railroads of the country were in need of repairs requiring more than 24 hours. Ten per cent is regarded as the maximum to be allowed in normal times.

The average cost of repairing a car on the Northern Pacific during the test period was $4.05 while in 1920 it was $13.69, Mr. Elliott told the committee, while the total cost of freight car repairs during the test period was $2,987,697 compared with $12,140,554 in 1920. One reason for this enormous increase in the cost of repairing cars he said was the fact

that since 1916, car repairers have been increased 229 per cent in wages.

Mr. Elliott also said that during the test period which covered the three years prior to June, 1917, 12,437,188 hours were spent by labor in the maintenance of equipment on the Northern Pacific at a cost of $3,729,839, or an average of 29 99/100 cents per hour.

In 1919, the hours put in at this work totaled 14,723,837 while the total labor bill was $9,526,696, or an average of 64 70/100 cents per hour. In 1920, the hours totaled 16,333,388 and the total labor bill was $12,401,287 while the average cost per hour was 75 63/100 cents. On this basis, the increase in hours in 1920 over those for the test period was only 31.33 per cent while the increase in the total cost was 232.49 per cent.

He furnished the committee with figures which showed that there was an increase of 76 per cent in the cost of materials for equipment repairs during the year which ended on February 28, 1919, compared with the test period, and of 97 per cent for the year which ended on February 28, 1921, over the test period.

Mr. Elliott filed with the committee a table which showed that out of 30 classes of railroad employees, the wages of 19 increased more than 100 per cent from 1916 to 1920 and only 9 received less than 100 per cent.

Mr. Elliott read into the record a report made to him by an official of the Northern Pacific in Seattle, Washington, which showed that the increased rates have had very little effect on the movement of lumber and other products from that territory. The report said in part:

"With reference to your inquiry as to the extent to which I think the increased rates on lumber or other products in this territory have checked business, I can truly say that it has had little, if any, appreciable effect in that direction, and this opinion is almost daily confirmed in discussion with various interested shippers of different commodities.

"Take forest products, for instance. The reductions in selling prices during last year amount to more than the entire freight rate to Missouri River territory, notwithstanding which there is a decreased movement.

"A year ago the ocean rate from Puget Sound to the Orient was $45 per thousand. Today it is $10, but notwithstanding this heavy reduction in the ocean rate, together with very much lower prices for lumber, has not stimulated the demand or increased the movement, indicating conclusively that there are other and more controlling factors determining the present situation. This is also true of many other commodities.

"The public generally are not yet satisfied to buy. Readjustment is necessarily a slow process, and out in this territory at least retailers are still endeavoring to hold up their prices until they can dispose of their high priced stocks. However, I believe the situation is gradually improving."

While Mr. Elliott was discussing the effect of the rate increases, Senator Pomerene said that he had had information from all over the state of Ohio that many shipments of roadbuilding and building materials have been prevented by the high rates and that lower rates would give the railroads more traffic in these materials. Mr. Elliott replied that he had said that some of the rates should be readjusted and the railroads were giving close study to that situation. Senator Pomerene asked if it were not possible for the railroads and the shippers to get together with a view to discussing such readjustments without the necessity for long hearings. Alfred P. Thom, counsel for the railway executives, said that a conference between the traffic officers and the shippers of roadbuilding materials had already been arranged for June 2 and that he proposed to present as a witness later Edward Chambers, vice-president of the Atchison, Topeka & Santa Fe, to discuss the rate situation. He said he thought the committee would be surprised to learn from Mr. Chambers of the extent of the readjustments in rates that have already been made. Senator Cummins remarked at this point that when Congress is willing to make another appropriation to help sustain the railroads it will be time to talk about reducing rates, but when the railroads are receiving very little net income it is quite obvious that many rate reductions cannot be considered until expenses decrease.

During Mr. Elliott's discussion of maintenance expenses, Senator Cummins remarked that he understood the Northern Pacific had just made a settlement with the Railroad Administration and asked how much the government had paid for undermaintenance. Mr. Elliott replied that the government had been unwilling to specify how much of the amount was for undermaintenance or to allocate it specifically and had taken the position that it did not intend to do so in the case of any railroad. The company had finally agreed to settle on a trading basis by which they received $9,000,000 in cash with an agreement that the amount should be readjusted later as a result of the check of the stocks of materials and supplies. One million dollars of the amount was specifically stated as for materials and supplies and the balance represented undermaintenance and other items. The company did not think the settlement entirely fair, he said, as it represented about 50 cents on the dollar of its claim, but thought it was better to make a settlement. He said that the railroad is not yet up in maintenance to where it was in 1917 and expects to spend a large part of the $9,000,000 to restore Northern Pacific standards. He said the roadway and the locomotives were now in better condition than when the property was returned, but the cars are not. Mr. Elliott said that in the negotiations with the Railroad Administration, Director General Davis had made the point that there was not enough money in sight to pay all the claims of the railroads, whereas the railroad officers had taken the position that that was a consideration for Congress rather than the Railroad Administration. Mr. Elliott said the sticking point in the negotiations was the difficulty in proving the amount of undermaintenance of the equipment. The company had claimed about five and one-half millions on this account, whereas the Railroad Administration also had a claim against it for overmaintenance.

Senator Cummins said it had been charged that the railroads had increased their operating expenses by their failure to continue various unifications made during federal control. Mr. Elliott said that some unifications had produced savings and some had been found to produce an increase in expenses and had been discontinued. The entire question of unification of facilities, he said, is now being carefully considered by a special committee of the Association of Railway Executives and railway officers are keenly alive to the situation, but in many instances where a superficial view appears to warrant unification closer investigation shows that it is not practical. At Seattle, he said, the unification of terminals produced an increase in expenses, and while the total amount of savings that might result from unification of facilities is substantial, it is such a large sum as to represent an important element in the situation. Senator Cummins asked the witness' opinion as to the economy that might result from the pooling of freight cars. Mr. Elliott said that this is a big question with two sides to it. In tight times the railroads have practically pooled the cars, but he was inclined to the opinion that better results can be obtained in the long run under individual ownership of cars. He pointed out that the Interstate Commerce Commission now has power to move cars in an emergency and the railroads have their own organization working with the commission.

Senator Cummins asked Mr. Elliott, as he had asked Mr. Smith, to file with the committee a statement of the operation of the railroads by months for the past several years, saying he wanted the data to prove or disprove the charges made that the railroads had expended too much for maintenance and operation during the guaranty period of 1920. Mr.

Thom pointed out that the transportation act makes the railroads responsible for maintenance expenditures above an amount to be determined by the commission.

Railroads Should Be Allowed More Latitude

In response to requests by members of the committee for specific recommendations as to what could be done to improve the present system of governmental regulation of the railroads, Mr. Elliott submitted the following suggestions:

It is a very grave question whether *regulation* has not been overdone, encroached on the field of *management*, and by dividing responsibility and checking initiative done more to increase costs and therefore rates than would have been the case with more freedom of action permitted.

Inasmuch as the Interstate Commerce Commission, under the new transportation law, controls the aggregate earnings of the railroads, and there is a limitation upon the rates to produce that aggregate, and a provision for sub-dividing the earnings if there is any excess, it would seem as if there was no longer any need of the Hepburn act.

Better and more prompt results for the public could be obtained if railroad managements, familiar with all local conditions, studying constantly their business, and trying to expand it, should be allowed to make rates effective, subject to investigation and review by the commission and to be set aside after such review, if found in any way contrary to public policy, and due reparation then made.

The labor board has been empowered to take up and settle disputes about wages, and about rules if a dispute about rules threatens strikes. Here is a tribunal set up by the Congress for the purpose of handling any labor disputes, and prompt action is very necessary; also the hands of the labor board should not be tied by a mandatory statute such as the Adamson law, and I believe, in the interest of the public, that law should be repealed.

The public are allowed to appeal to the Commerce Commission if they think rates are too high. I believe the public should be allowed to appeal to the labor board if they think wages (ultimately paid by the public) are too high.

Let the railroad managements and the men get together and try to settle their differences, and authorize the railroads to name the rates of pay, and working conditions, subject to review by the labor board, and subject to reparation if the railroads should do anything that was unfair.

It would seem as if it was a mistake to attempt to enforce so-called standardization of all wages and rules, which standard, so far as pay is concerned, is a misnomer, because by giving a man the same rate in a little town in northern Vermont that he gets on the outskirts of New York is really paying the New York man less than the Vermont man, because the latter can live more cheaply.

Let labor organizations be incorporated and state clearly in the charters what is intended; they should be bodies that could sue and be sued, and there should be the same publicity of all their transactions as there is about the transactions of the railroads, reporting the number of members, amount of money received, distribution in detail; in a general way just as much information filed with governmental authorities as there is by the carriers.

If disputes threaten a strike, let the federal government, possibly the Secretary of Labor, frame the form of question about which the strike vote is to be taken, and not let that vote be framed by either the labor organization or the railroads. Have that ballot handled by the Secretary of Labor and the vote should be secret—neither the railroads nor the labor organizations to know how any man votes—the Secretary of Labor to count the ballots and announce the result.

Unless at least 75 per cent of all employees in the craft about which there is a dispute voted to strike (not 75 per cent of the ballots cast) then the strike vote is not carried. If 75 per cent of all employees vote to strike, then a strike not to begin until 30 days' notice has been given.

Under such plans, the public would be protected, because the owner and manager would always, in naming his prices or rates, have in mind the fact that if he went too far, his price or rate could be set aside by the commission and reparation made. He would also have the labor board's power to reckon with if he attempted to be unfair in his wage adjustments and here again make reparation if he did wrong.

In other words, restore to the owner and manager some of the functions surrounding other business and which, when exercised in the upbuilding of the railroads in years gone, produced a most remarkable transportation machine with the lowest rates in any country, the highest wages in any country and the best service in any country. The war and the interference by the government in this delicately adjusted transportation machine have produced conditions resulting in greatly increased charges and poorer service to the public, and a checking of developments so necessary for the next uplift in business.

Action, courage and vision is needed now and imperatively needed.

We talk about frozen credit and we have a frozen transportation system that helps to keep credit frozen and retards the growth of the country.

Let the railroad owner and manager have a little liberty of action and in the long run, in my judgment, better results will be obtained for the country.

Mr. Elliott also suggested the appointment of a Secretary of Transportation to have the same advisory power as other cabinet officers. He commended the work of the Interstate Commerce Commission but said it was overburdened with work. He thought that a Secretary of Transportation, by advising with the Interstate Commerce Commission, the Railroad Labor Board and the railroads, could bring about the desired result—promptitude of action.

A. H. Smith Describes Results on New York Central

Resuming his testimony before the committee on May 19, A. H. Smith, president of the New York Central, said that "loss in the effectiveness of labor" due to the operation of the national agreements and the increase in the labor bill as a result of reclassification of employees, was one of the main reasons for the increase in the cost of furnishing transportation service to the country.

The witness declared that due to the reclassification of employees cases were numerous where a number of employees were required to do work formerly performed by one. The average pay per man in the locomotive repair department increased from $134.47 per month in 1919 to $166.52 per month in 1920 and in the car department from $147.19 in 1919 to $187.25 in 1920.

As reflected in the cost of maintenance of equipment, Mr. Smith testified that because of the abolition of piece work and the advent of the national agreements, it cost the New York Central $5,448,300 more and required 60 per cent more men to turn out only 2 per cent increased work in the company's locomotive repair shops compared with 1915.

"Under piece work and the other shop conditions existing in 1915, 2,799 men turned out 73,072,000 shop miles," he said. "In 1920 practically the same amount of miles were turned out, namely 74,655,000, but it required the services of 4,521 men. The cost in 1915 was $2,903,700 and the cost in 1920 was $8,352,000, or an increase of $5,448,300. That is to say, there was an increase in men of 60.3 per cent and an increase in money of 187 per cent and the mileage output was increased but 2 per cent."

Mr. Smith told the committee that from the standpoint of the railroads nothing was gained by the reclassification of employees which has resulted now in "everything being done by agreement and regulation."

"Not only were wages of specified classes of employees raised but many employees were placed on higher grades than those in which they were prior to the orders and national agreements," Mr. Smith said. "The reclassification not only had the effect of increasing wages but very largely increased the number of men."

In the locomotive department alone of the New York Central Lines, Mr. Smith said, the number of employees on the monthly rolls was increased from 11,545 before the agreements took effect to 11,972 immediately following the agreements and to 13,665 in 1920. In the car department the average number of men employed in 1919 was 12,350. By the operation of agreements and rules made at the close of federal control, the average number of men in this department was increased to 13,888.

Going into details, Mr. Smith stated that an air brake repairer in December, 1917, was paid 27 cents an hour. Under an order of the director general, the rate of pay was raised to 58 cents and under the national agreements, his

classification was changed to that of tender repairer and automatically his wages were raised to 68 cents per hour.

An engine cleaner, who in December, 1917, was paid 22 cents per hour was raised successively to 45 cents and then as a painter-helper to 49 cents.

A stripper was raised from 30 cents an hour in December, 1917, to 68 cents an hour and then under the national agreements became a machinist at 72 cents an hour.

In the car department, a passenger car inspector in December, 1917, was paid 37½ cents per hour, then 63 cents and under the national agreements became an inspector leader at 67 cents.

Oil room men in 1917 were paid 28¼ cents per hour, then 68 cents and under the national agreements became blacksmiths at 72 cents an hour.

Starting at 55 cents, blacksmiths under orders of the director general went up to 68 cents and classified as hammersmiths under the national agreements received 82 cents an hour.

An additional cause of increased labor costs due to these orders and agreements was the application of punitive overtime to all classes of employees. Overtime which had previously been paid at pro-rata hourly rates was placed on a time and half basis, increasing by 50 per cent the rate per hour for overtime pay.

Mr. Smith pointed out that the above rates were those prevailing before the increased wage award made by the Railroad Labor Board in July and made retroactive to May 1, 1920. This involved for the New York Central Lines alone an increase in wages of approximately $21,640,000 including back pay of $8,100,000.

Mr. Smith was frequently interrupted during the reading of this part of his statement by Senators who inquired as to the reasons for the various reclassifications which were made by the railroad administration in the fall of 1919. At one point, Senator Pomerene of Ohio inquired as to how an oil room man came to be classified as a blacksmith. "I haven't the slightest idea," Mr. Smith replied. "They might just as well have called him a saint and paid him accordingly."

Mr. Smith presented an exhibit showing how a man previously engaged in sharpening crow bars and similar work and classed as a laborer had been reclassified as a blacksmith at 65 cents an hour and with $1,710 back pay.

Another exhibit filed with the committee showed the increases in pay of train service employees in 1920 over 1917. Among these were freight engineers, 54 per cent; firemen, 70 per cent; yard engineers, 73 per cent; firemen, 124 per cent, and passenger conductors, 56 per cent.

Interrupting the reading of his statement, Mr. Smith praised the loyalty and services of the trainmen and enginemen. Unlike ordinary workmen, he said, they are specialists, men who have devoted their lives to railroading and who are the backbone of the transportation system.

"Overtime payments on the New York Central for 1920," said Mr. Smith, "amounted to $25,540,073 at the punitive rates. Under former arrangements providing for straight overtime at pro-rata rates this would have amounted to only $17,786,188. The additional $7,753,885 represent the penalty imposed upon the company by the agreement requiring payment of punitive rates. There is no argument about overtime. We ought to pay that. Everyone recognizes that. But it is this punitive overtime to which we object."

Mr. Smith said he sought to have the director general modify the rule, telling him that the railroads would rather pay a premium to employees to get the trains in on time than a reward for keeping them out overtime.

Mr. Smith told the committee that the property of the New York Central was "very much undermaintained" during 26 months of federal control. Under the standard set by the company, 7,315,000 ties, 1,325,000 cubic yards of ballast, 138,500 tons of new rail and 134,000 tons of second hand rail would have been put in during the 26 months had the road been under private managements during that time. In reality, he said, the director general only put in 5,445,000 ties, 1,000,000 cubic yards of ballast and 138,000 tons of rail. This deficient maintenance imposed a heavy burden upon the road when it was turned back to its owners.

Causes for Decline in Traffic

Taking up the causes for decline in traffic beginning in January, Mr. Smith attributed this decline in part to falling off in export business amounting to $657,000,000 in the first three months of 1920, as compared to the same months of 1919. It is a matter of common knowledge, Mr. Smith said, that the harbors were crowded with idle vessels, whereas prior to January it was necessary in order to avoid congestion at terminals for the railroad to issue export permits. Now the permit system has been abolished because there is much more shipping than there is freight to be carried.

High discount rates also tended to curtail business, the witness stated. "Another cause," he added, "was the propaganda which spread through the country against purchasing at high prices, and which led to a marked reduction in the purchases of commodities generally.

"It was well understood that the period of war inflation would have to be followed by a period of deflation. The general causes were in effect and were manifesting themselves prior to the rate increase of August, 1920, and it is not believed that this increase had any decided bearing upon the falling off in business, which became apparent in January, 1921."

Taking up the question of efficiency as reflected in the transportation department of the New York Central, Mr. Smith said that the average revenue per ton-mile increased 54 per cent in 1920 over 1917. The average monthly pay of all employees increased 86 per cent. "The relative efficiency of employees in producing revenue ton-miles decreased 10 per cent. That is to say it took 10 per cent more men in 1920 to do the same amount of work. This comparison is made as between 1920 and 1917 because the number of revenue tons carried one mile in 1920 was practically the same as the revenue tons carried one mile in 1917, the actual figures being 22,567,929,000 in 1920 and 22,452,548,000 in 1917."

The efficiency of a railroad, Mr. Smith said, depends principally upon its men. "It is estimated that 95 per cent of railroading is human; it is a business of moving things; it is a live thing. At the close of government control labor naturally desired to have rules and regulations set up for their best interests in the future, and the corporations inherited what was awarded to them. Railroad men are no different in their desire than labor in other endeavors.

"These men engaged in this special endeavor of handling transportation on which our country so greatly depends should receive an adequate wage. But after compensation comes results—that is, what shall labor do for what it receives, and that is in a measure where our difficulties have been. It is a matter between management and labor, to be decided on its merits, and will no doubt now be taken care of."

In concluding his prepared statement Mr. Smith said:

From the foregoing statements and figures the following facts are stated and conclusions are drawn:

For the year ending December 31, 1920, revenues increased 19.5 per cent over 1919. For the year ending December 31, 1920, operating expenses increased 40.8 per cent over 1919.

For the last four months of 1920 freight revenues increased 40.1 per cent over the corresponding months of 1919 and all revenues increased 29 per cent over the corresponding months.

For the same four months operating expenses increased 1920 over 1919 43 per cent. For the eight months from May 1, during which the increased wage order of the Labor Board was in effect, operating expenses increased 55.4 per cent. Of this in-

crease 37.7 per cent is represented by labor. The remainder is accounted for by the increased cost of material and supplies.

Neither traffic nor earnings decreased during 1920. The diminished traffic in 1921 was caused by the general business depression. That depression was not caused by increase in freight rates. Other causes sufficiently powerful to cause the depression were operative before the increase in freight rates was made.

The railroad management, hampered by the necessity of undertaking the operation of the property burdened with the large advances in expenses, with undermaintenance of way and equipment, and further burdened with the additional increase of expenses by reason of the orders of the Labor Board, moved all the tonnage that was offered during 1920, and endeavored to make substantial progress toward restoring the property to the standard which the best judgment considered necessary to enable it to do properly and safely the business of the public.

The enormous increases in operating expenses have been in the main due to the great war. War necessities broke through and largely destroyed normal conditions in the industrial world. The materials of war had to be supplied at any cost of labor and material. The situation had to be met in the railroad world, and it was met. This statement does not attempt any apportionment of the responsibility. The war ended, but normal conditions could not at once be restored. That restoration can only come through time and patient effort, but pre-war or normal conditions and a normal cost of living can only be restored by general reduction in the cost of both labor and material.

Senator Watson asked if the falling off in traffic which began late in the fall resulted from the increased rates or from a falling off in the industry of the country. Mr. Smith replied that it was due to the industrial situation, "the state of mind of the people" being a great factor. Industrial stagnation had been brought about by the fact that many persons were holding off buying in the hope of a reduction in prices.

"If rates were lower, what would be the effect on traffic," asked Senator Pomerene of Ohio.

"I wish I had the power to try it out," replied the witness, "I'd like to have the authority to move a million bushels of grain and see if there was a market for it."

If the railroad operated on maximum traffic with the present rates and costs in effect, Senator Watson asked as to whether it would make money.

"You can't do it because the costs are too high," answered Mr. Smith. He added that he believed some rates should be readjusted because successive percentage increases had thrown some of the rates out of line. There could not, however, be any general reduction in rates until there is a reduction in expenses which will assure the earning capacity of the carriers.

Compilations made by the New York Central showed, Mr. Smith said, that in the locomotive repair shops of that railroad there was a decrease of 25½ per cent per man hour in the output of employees in the last six months in 1920 compared with the first six months in 1918.

In the first six months of 1918, he said it required one man 113.4 hours to produce 1,000 shop miles, which is the yardstick of efficiency in the repairing of locomotives. During the first half of 1919, this had been increased to 134.8 hours and in the first half of 1920, it was 146.9 hours. For the last six months of 1920, the labor had increased to 152¼ hours, which was an increase of 30.1 hours or 34½ per cent compared with the first six months of federal control of the railroads.

Asked by Senator Cummins as to the reasons for this showing, Mr. Smith replied that it was due to the abolition of piece work and the injection of rules whereby two men were required to do work formerly performed by one "as well as the hundreds of things that have been injected into this work since the war began.

"Senator, you are playing with human nature all the time and a man will not perform as well when his work is measured by time as when it is measured by performance."

Senator Wolcott sought to ascertain if Mr. Smith knew who issued the various Railroad Administration orders.

"I hold no brief for the Railroad Administration," said the Senator, "but there is a tendency to blame the administration for the superimposing of various orders to which objection is now being made."

"Mr. McAdoo is not a railroad man and we all know that," interjected Senator Kellogg.

"I've not mentioned Mr. McAdoo," quickly rejoined Senator Wolcott.

"He's the man who did it and everybody knows it," declared Senator Kellogg.

Outside Contracts for Locomotives

Taking up the repair of locomotives in outside shops, Mr. Smith declared the New York Central was forced to let outside contracts because, while the company shops were being operated at the maximum, it was impossible to repair all the locomotives requiring attention. He denied that any work done for the company in outside shops had been performed at excessive prices or that the company had any interest whatever in the Baldwin Locomotive Works.

"In view of the fact that everything possible was being done to realize output from the company's shops and as it was apparent that they could not, from the pace being made, repair the locomotives that required attention, the only alternative was to contract for the work in outside shops," Mr. Smith said.

He explained, however, negotiations were entered into with the Baldwin works as well as the Lima Locomotive Works and the American Locomotive Company in order to "obtain the lowest price at which repairs could be made by them."

"Was this work done at a fair price?" asked Senator Cummins.

"Yes," he replied, "but it was done in a seller's market and a seller's market is higher than a buyer's market." The outside shops did not want repair work," Mr. Smith said, "and in some cases pressure had to be brought to bear to induce them to accept it. I told the Lima people we would never buy another engine from them unless they did."

During the period that locomotives were sent to the outside shops for repairs 13,239 men were employed in the company shops compared with 11,326 in July, 1919. In August there were 13,882 men employed compared with 11,410 during the same month the previous year; in September, 14,343 compared with 11,449 the previous year and October 14,039 compared with 11,972 in October, 1919.

"During this same period the shop mileage output notwithstanding the number of men employed, decreased sharply in September and October," he said.

"The repairs in the outside shops were made under the supervision of competent representatives of the railroad company acting as inspectors. Criticism has been made of the amounts paid or agreed to be paid to those outside companies for the repairs and this criticism has been sought to be fortified by statements that the same repairs could be made or that repairs of the same class actually were made in railroad shops for vastly less amounts of money. It is sufficient to say as to this that the reported cost of the repair of a locomotive in a company shop covers only the labor and material involved and no other factor enters into it. To these costs the outside shops add 120 per cent for profit, interest, and other overhead charges, which are not shown in the railroad shop costs." He added that after business fell off he stopped sending engines to outside shops.

Regarding charges that have been made that part of the increase in operating expenses was due to failure of the railroads to introduce mechanical improvements designed to bring about economies in operation, Mr. Smith said:

"If there is anything that can produce economy and we can get the money to do it, you can rest assured we will get

it. I know of nothing in the last word of engine construction that we have not adopted."

Eighty-five per cent of the total number of locomotives on the New York Central Lines, he said, are equipped with superheaters, while 96 per cent of the locomotives fit to have them are so equipped. He also said that 98 per cent of the locomotives have brick arches.

In addition to the improvements already installed, Mr. Smith said the New York Central was constantly experimenting with new devices designed to improve efficiency.

He estimated that the company would be able to save in the neighborhood of five and a half or six million dollars in its coal bill this year.

Mr. Smith said several times during his testimony that he had no desire to criticise the government for what was done during the period of federal control and that he had once or twice tried to interject the statement that it was up against a difficult situation. He referred to the fact that he was with the government as regional director, that the railroads had difficulties before the war and the government found many difficulties afterward. It was a question of winning the war and doing the best under the circumstances, he said. Senator Kellogg asked why if piece work was considered more efficient, an order was given to abolish it. Mr. Smith said that he was merely on the firing line and that the general had ordered the piece work taken out. He hated to make the move, but he did it. "I was merely a soldier in the ranks," he said, "so why they did it, I don't know. I used to kick, but it did not do any good."

At another point Mr. Smith said he was not claiming that the increase in wages was not necessary, but if he had had his way he should like to have had a good bonus given to the men during the war and then looked it over afterward in accordance with the conditions existing and not tie it up for the future. He also pointed out that the rules of the national agreements were put into effect just before the government let go of the railroads, although it was known that they were to be returned.

Senator Watson asked the witness if he made his recital the basis of some recommendation by which the railroads could get back to average man efficiency.

"The recital is made," replied Mr. Smith, "because you asked us for the facts. You asked us to tell you why 1920 was as it was. As to the future, of course, we have got to change the situation in some way or we cannot go on. We are in bad shape today and getting worse every day. What has happened is not concerning me one-tenth as much as what we are going to do because we are going the wrong way this moment and the things that governed me then in regard to these methods and these actions are no help to me now. I should be up and figuring what I am going to do for next winter because just as soon as business returns, and it will return, then you will want these transportation machines and I say to you they will not be ready. You will want them and they will not be there. We have not had any chance to get any fat on us in 20 years. We haven't had the opportunity that other business has had. Other business has good years and can lay up a sum in real money for the rainy day, but we have never had that opportunity and now while we should be repairing these locomotives and getting this plant in the very best order, for the future, we are not doing it. We haven't the money."

Senator Watson said he wanted to "put the grease where the squeak is."

"Well," replied Mr. Smith, "the squeak is that our cost factors are too high. I don't mean only labor, but our material is too high and our fuel has been too high and all of these things have gone up. Our taxes are awfully high. I don't imagine they can be reduced, but there they are. I think labor on railroads should have liberal consideration, but in some instances labor is out of line now. I should say that we have gotten out of balance with the outside. There was a time when that was the reverse. There was a time when these rates were held so low on us that a railroad was not paying its men fairly, but the people did not give us money enough so we could and we were always having an argument with our men, they wanting more and we not being able to give it to them."

Railroads Should Have More Latitude

This led to a discussion of the effects of railroad regulation and Mr. Smith pointed out that the railroads no longer have much latitude. "What made the railroads," he said, "was vision, initiative, energy, study, competition. Now when you tie us up so there is nothing of that left we just plod along like the plow horse hitched to the other one."

Senator Cummins asked what particular restriction should be removed. Mr. Smith replied that he was not a lawyer and that perhaps his suggestions would be considered too general, but he would like to see more freedom of activity allowed to the railroads. "I do not mind regulation," he said. "I do not mind coming in and telling you what we have done or that we have not done it. I do not mind a yardstick of duty laid on me and if I do not do my duty, why do something with me, but we cannot do much nowadays. If we want to buy anything or if we want to get anything we have got to come down and have a long hearing before it is done. We must show all there is to it." In reply to questions, he said he would not advocate the withdrawal of the supervisory power of the Interstate Commerce Commission over rates, but he would like to see the Interstate Commerce Commission so placed that they could allow him to put in an emergency rate, see whether it would move traffic, and if it did not, put the rate back. The difficulty, he said, is that if a rate is reduced and fails to produce the desired effect, it is necessary to "go over some pretty high hurdles" before it can be put back. He said undoubtedly some rates are too high as a result of the percentage method of advance and also many are too low. He thought they could be readjusted if the railroads were allowed more latitude, but that to do so it is necessary to move faster than can be done under the present system.

Senator Cummins asked whether he would advocate the abolition of the labor board.

"No," replied Mr. Smith, "I think the labor board is a good thing. I would like to see the board situated so that it can function more rapidly and perhaps it will when it gets more practice. I have no quarrel with the labor board and the Interstate Commerce Commission is a necessary umpire in this game, but, to use a baseball illustration, we are not allowed very much latitude on the bases. We are held up pretty tight."

Senator Cummins announced that he had had a request from the heads of the four train service brotherhoods for an opportunity to testify at the hearing and that they would be allowed to appear at a date to be determined later.

Mr. Elliott completed his statement before the committee on May 25 and he was expected to be followed by H. E. Byram, president of the Chicago, Milwaukee & St. Paul; Samuel Rea, president of the Pennsylvania; Edward Chambers, vice-president of the Atchison, Topeka & Santa Fe, and E. T. Whiter and J. G. Walber as representatives of the railroads' committee that presented the evidence of the railroads before the labor board.

THE MONTHLY MEETING of the Rrailway Club of Pittsburgh was held on May 20 at the Fort Pitt Hotel. Judge Joseph Buffington of the United States Circuit Court addressed the meeting on "Government, Patriotism and Duty." The next meeting will be held in September.

Vitalizing Locomotives to Improve Operation*

Present Conditions Can Only Be Met Successfully by Utilizing All Factors That Increase Capacity

By George M. Basford

NOTHING our railroads have done in recent years is more potent in solving present and will be more effective in solving future transportation problems than the improvement in the locomotive and improvement in its operation. Nothing can prevent success. The railroads have clearly shown the way to reduce the cost of transportation by what they have already done. It remains to follow this path intensively. Transportation equipment is again coming to the test of the advance of a vast and growing nation. Vitalize the power that the country depends upon. Vitalize it to reduce cost. Vitalize it for increased capacity.

The times call for directness, for elimination of the unnecessary, for effectiveness, for efficiency. That the railroads

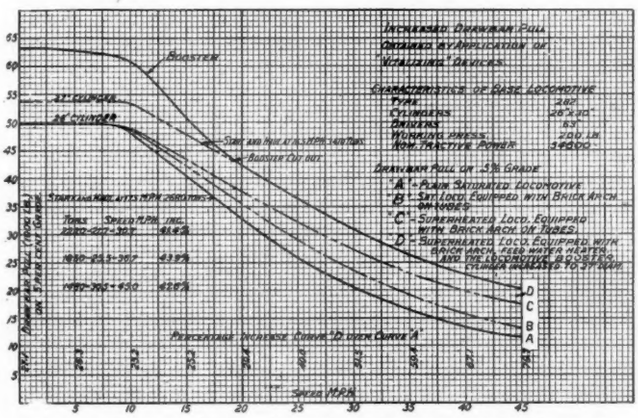


Fig. 1—Increased Drawbar Pull Obtained With Capacity Increasing Devices

have made wonderful progress should be made known to the public. That means are at hand for even greater accomplishments is known to every railroad man. Getting trains over the road has been the absorbing problem of the past. Getting them over the road and at lowest cost is the problem of the present and will be that of years to come. The locomotive of today is ready for its part in this.

Heavier Engines

For about 70 years there was no fundamental improvement in our locomotives in ways that made a pound of metal and a pound of coal do more work. For 70 years locomotives were small. They were well adapted to the service required. It was not severe service. The machine conformed closely with conditions of the time. When the heavy train load period came, engines were made larger, heavier and more powerful. For years the railroads had no other way to overcome increased cost of operation but by building larger locomotives. Costs went up and rates came down. This was met as long as it could be met by building larger and heavier engines. The public should be shown that this was done and well done. This continued until about 15 years ago when the largest locomotives reached the limit of the human fireman. This limitation revealed the necessity for providing higher efficiency.

Up to this time simplicity of construction was the designer's compelling rule. There could be no complication. Locomotives had to be as simple as a grindstone. The prejudice against so-called "complication" served, for a time, seriously to delay improvements, but far-seeing, courageous officials began to understand that certain results must be attained, and that well designed, well constructed improvements must be accepted and must be cared for in order to secure those results. This objection to complication is a relic of the past. It yielded when mere increase of size and weight did not suffice.

Successful Improvements

Until 19 years ago when the superheater made its advent on this continent, there was no persistent, systematic, successful improvement increasing the power capacity of the American locomotive, through increased efficiency in the use of heat.

With and largely as a result of the development of the superheater and the improvement of the arch came a revolution from rule of thumb to scientific design of locomotives as a whole. Heating surface, firebox volume, tube surface and boiler design throughout began to be based on the amount of steam the cylinders required. Other very important improvements became successful. Improved valve gears, automatic stokers, combustion chambers, firebox improvements, automatic fire doors, power reverse gears—all these have been brought to practical success during the present official generation. Latest of all are the feed water heater and the booster. The seven principal capacity increasing factors that mean most in the present situation that calls for capacity with efficiency and fuel conservation are the air brake, the superheater, brick arch, feed water heater, booster, mechanical stoker and light reciprocating parts of improved steel.

Six of these factors increase the capacity of the locomotive by increasing its horsepower and the air brake by making it possible to control long trains and by shortening stopping distance. They do not require increase in weight of rail or increase in strength of bridges. They are now playing a

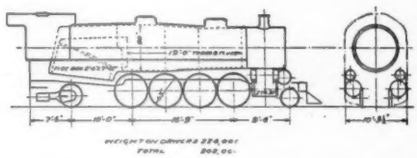


Fig. 2—A Typical Improved High Capacity Locomotive

vital part in the welfare and the business of the country and they are helping and are ready to still further help reduce the cost of transportation.

That the policy of many railroads in recent years in equipping new engines and many old ones with two or more of the capacity increasing factors was eminently wise has been proven and judgment rendered. If this policy had not been adopted the record breaking ton mileage of the year 1920, without materially increasing the number of locomotives in service would have been impossible. It was the capacity increasing factors built into new locomotives of the past few years, the incorporation of these factors into many

*From a paper presented before the New York Railroad Club, May 20, 1921.

old engines, and the conversion of old engines into up-to-date ones that did it. This demonstration justifies the policy of equipping so many old engines with improvements that compel a ton of coal to do more work. That policy has made good completely. These capacity increasing factors are ready to do more than anybody realizes. Only the surface has been scratched.

This Is Ready Now

A certain large passenger locomotive, built five years ago, and which was up-to-date at that time, was being taxed to its capacity. It had reached its limit of load and speed. It had no reserve for bad weather or unusual conditions of service. A thorough study reveals the fact that this locomotive, already among the largest and most powerful of its class, may be replaced by one of the same type, but giving 58 per cent more starting drawbar pull, producing 30 per cent more drawbar pull at 60 miles per hour and with no more destructive effect upon the track than the present engine at 60 miles per hour, the destructive effect at 70 miles per hour, being less than that of the present engine. In this study absolutely nothing new or untried was contemplated. Refinement of design was considered, also enlarged capacity by a specially high degree of superheat, an improved firebox, the arch, light reciprocating parts of high grade steel, plus the booster to give greater starting power.

Think a moment of the operating advantages to be had from over 50 per cent more starting power and 30 per cent more drawbar pull at 60 miles per hour. This design did not include the feed water heater because it was not ready for consideration at the time. Heating the feed water by waste steam would still further increase the power of this engine.

Any builder may build this engine. It is the first example, of which I have record, of a design for high power, which was prepared co-operatively by a railroad, a locomotive builder and by the engineers of the concerns which are devoting themselves to improvements for increasing capacity. Similar improvement is available to any railroad.

Of course, such a locomotive will cost more than a weak and obsolete one. It will, however, increase operating speed, reduce double heading, will apply high wage crews more effectively and will cheapen operation.

This increased power per engine will reduce the number

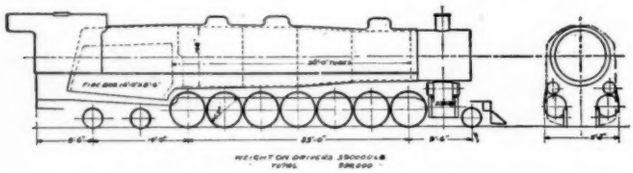


Fig. 3—A Plain Saturated Locomotive to Deliver the Same Drawbar Pull at 45 Miles an Hour as the Engine Shown in Fig. 2

of engines required to do a given amount of work. This will reduce maintenance. Obviously, it is easier to maintain two engines with these capacity increasing factors than to keep up three without them. The cost of these improvements is now going into coal and wages. It may go into new engines when by improving old ones the new ones will not for a time be needed.

Progress

Progress in the use the railroads are making of locomotive improvements is revealed by many examples of heavy trains and fast schedules. Here are three:

First: A well known road has increased its average revenue tonnage from 400 tons to 1,700 tons per train in 25 years, the maximum revenue tons handled in a regular train being 3,200. This road shows 233 per cent increase in weight of train and 66 per cent increase in speed in 25 years. It hauls 5,000 ton trains on 25 mile schedules. It makes excellent use of improved locomotives. In five years the average revenue train load of the country as a whole increased from 475 tons to 728 tons, or an increase of over 53 per cent since 1915.

Second: The 20th Century is the direct successor of the World's Fair Flyer of 1893 and represents continuous development. The weight of that train has increased 215 per

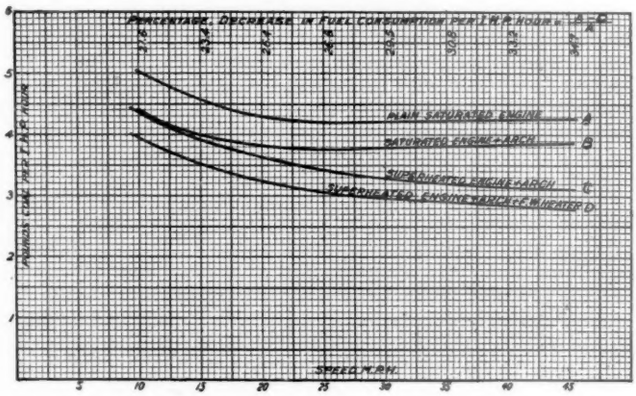


Fig. 4—Fuel Consumption of Locomotives With and Without Power-Increasing Factors

cent and its speed has increased seven per cent. *Only an improved locomotive can haul it today.*

Third: Consider the fact that the heaviest passenger trains on one of the Western roads weigh 1,290 tons and are on fast schedules with maximum speed of 68 miles per hour. It is only 25 years ago that the newspaper men of New York were invited to see a 600 ton passenger train slowly pulled out of the Grand Central Terminal by what was then considered a monster locomotive. That locomotive is now hauling a milk train on a branch line. It and its class have given place to really powerful ones that were not then dreamed of. Today the fastest long distance trains in the country weigh twice as much as the exhibition train referred to. Until we are reminded of the past we do not appreciate what the railroads have accomplished.

Capacity First

In the usual sense of the expression saving fuel will not greatly reduce the cost of transportation, but conserving fuel by compelling every pound to yield more power will do so because it involves operation as well as engineering improvements. Power to get the maximum business delivered is the cheapest power. Heavy pulling at favorable speeds will reduce cost and as congestion increases, speed becomes a greater factor. Power to keep trains on time, to get through storms, to get in under the overtime limit is what is needed. Let us take a glance at some of the power increasing, capacity increasing factors with a view of giving the operating officer greater power capacity to work with. Many others are important and would be discussed here if time permitted.

Brick Arch

For many years arches have been used in locomotive fireboxes. Their function is to baffle the gases and flame on its way to the flues. They mix the gases from the fire, aiding combustion. They cause the burning of many of the cinders and they protect the flues from streams of cold air from the fire door, or from holes in the fire. They protect flue sheets and materially reduce honey-combing. Arches increase the heat making capacity of coal and reduce boiler failures, thus

increasing the availability of engines. Success of the present arch and arch practice is due to structural improvements in the bricks themselves and in methods of support that renders renewal easy and to improved firebox design. Over 43,000 locomotives now have these arches. Every engine fit to run at all should be equipped on coming out of the shops if it did not have an arch when built. There is no other capacity increasing factor so easily and so inexpensively applied to existing locomotives.

Superheater

To this improvement the largest increase in locomotive capacity is due. The heavy trains of today could not be handled without superheaters. In June, 1910, the Superheater Company got fairly started. Since 1910 our railroads have applied 33,000 superheaters to new and old locomotives, about 90 per cent of new ones having been equipped during the past few years. The application to many more existing engines offers a promising opportunity to still further reduce the cost of transportation. It is a financial error to operate any locomotive today without a superheater, and the penalty is perpetuated as long as the engine runs.

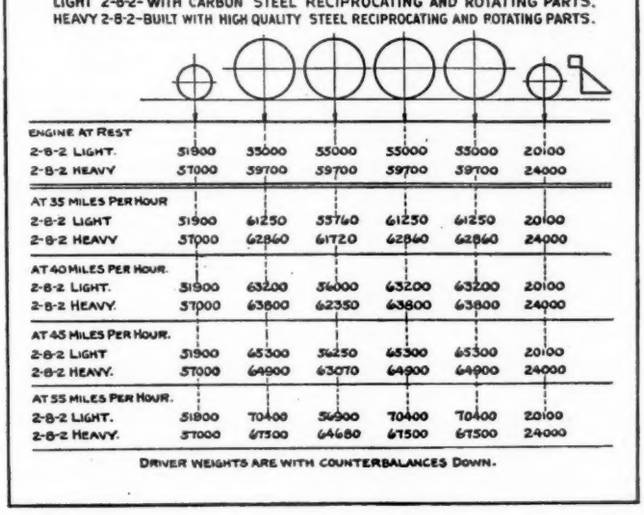


Fig. 5—Decrease in Rail Pressure Effected by Using High Quality Steel

Feed Water Heaters

This conservation factor is the first to utilize waste heat. It gives back to the boiler heat that is on its way to waste. For generations stationary and marine steam plants have used feed water heaters as a matter of course. The application to locomotives has been attempted many times and has waited only for practicable heater and pump. Thousands of European locomotives are already equipped and several thousand are being applied every year.

For over four years feed water heaters raising the temperature of the water from 40 to 50 degrees to from 230 to 250 degrees have been in successful service on locomotives in this country. These equipments also return for use again about 15 per cent of the exhaust steam in the form of water that has been distilled and filtered. This increase in the tender tank capacity is important in operating because of the ability to save some water stops.

Heat from the exhaust steam is returned to the boiler, giving the boiler less work to do. Therefore, less coal is burned to do a given amount of work or more work is done for the same amount of coal. Feed water heating is a success.

Booster

This capacity increaser is well named. It boosts a heavy train in starting and also on the critical points on grades. It is the latest improvement. It supplies an ideal method of utilizing weight and steam that is not needed for other purposes at low speeds and only at the time that the boost is wanted.

When the train is going the demand for steam is greatest. Immense boilers are needed at speeds. There is a surplus of boiler power when starting and at low speeds. The big boiler requires trailing wheels to carry it. This weight on trailing wheels is also a surplus when starting or when running slowly. The booster couples up this surplus steam and idle weight, making both useful to get the train going and to keep it from stalling on ruling grades. Usually there are a few points on a division which determine the load an engine can haul over the entire division. If these are mastered the rest is easy. This is one of the booster functions. Another is in starting a heavy train, getting it out of a siding or through the switches of a yard. Here is where the 70 to 100 feet of slack between the cars of a long train causes havoc with draft gear. The booster works like an automobile in low gear. It applies its extra power smoothly, avoiding the jerks that a big engine otherwise must give to get going at all.

Again, it solves the problem of the big passenger engine. With 20 to 25 per cent more starting power backing up to take slack is avoided, eliminating the frequent five to 10 minutes' delay in getting a heavy train moving every time it stops. Operating men will appreciate this advantage, especially when they have big passenger trains in several sections, each losing minutes every time they start, especially when they start on grades.

The booster will help keep passenger trains on schedule and the road clear for freight. It puts in your hand the means for placing any engine having trailing wheels into the class above itself in starting capacity. It is as good as another pair of drivers but avoids the larger cylinders, heavier rods and extra weight that these drivers entail and which are wanted only in starting. In fact the booster is better than another pair of drivers because it changes trailing wheels into drivers when wanted, and then changes them back into trailers when the pull is reduced after the wheels are rolling. This is conservation of the highest order.

Control is semi-automatic, giving the enginemen the maximum resource for starting power and a negligible minimum of attention or mental effort. Tests on a large railroad show for the booster the following results on a Pacific type freight engine:

1. An increase of 23 per cent in train tonnage, or
2. An increase of 12 per cent in speed on the division in question.
3. An increase of 18 per cent in drawbar pull at 7½ miles per hour.
4. An increase of 13 per cent in drawbar pull at 13 miles per hour.
5. An increase of 22 per cent in starting power.

It is an important tonnage increaser. It is capable of doing more to reduce the cost of transportation than any locomotive improvement except the superheater, and it does more to supplement the superheater than any other factor available.

David L. Barnes will long be remembered for advocating the wide firebox for locomotives. The change "came hard." Dr. Goss helped it immensely with his grate area test at Purdue. At first fireboxes were extended over the frames, but this was not enough. In those days locomotives had leading trucks and the rest of the wheels were drivers. The real wide firebox, needed for steam making at speed, brought the

trailer axle with its "idle" wheels. We hated the thought of wheels under a locomotive that did not work. This explains the struggle of the Prairie type which persisted until distrust of pony trucks at high speeds effectively buried that type of engine. We gave up not gracefully but under force. Next we became blind to the "idle" weight and went ahead until the country has a lot of it. The booster has given back what was lost and more. The booster uses this idle weight by applying power to the trailers.

Someone will say: "You are talking power and more power. We have too much power now and are compelled to run big, powerful Pacific type engines on light local passenger trains of five and six cars." Let me answer "yes." This work is being done with big engines because lighter ones will not make the time with the frequent stops of local trains. Put boosters on old Atlantic type and the lightest Pacific type engines that have been superheated and do this work with these engines that are suitable for it.

Increase of Capacity

The accumulated increase of capacity due to the superheater, arch, feed water heater and booster in indicated in Fig. 1. At 45 miles per hour the increased power due to these factors is 79.7 per cent, when they are applied in combination. This is now considered too high speed for such a heavy engine. These combined curves indicate that at 30 miles per hour the power increase for the same coal is 50 per cent, at 25 miles per hour 40 per cent, at 20 miles per hour 29 per cent. The diagram also shows the increase in the speed possible with the same load and fuel in case speed rather than heavier loading is wanted. At 30 miles per hour two engines completely equipped give as much power as three "plain" engines. The increased power in this case costs half that of another plain engine and the cost of maintaining two sets of improvements will be less than the cost of maintaining another complete plain engine. The base engine in the case is the Administration light Mikado, as it would appear if built without any of the improvements we are discussing. If greater drawbar pull, due to these improvements, is not desired, the curves show the increased speed that may be had with any given pull.

Fig. 2 outlines an engine equipped to give this power. The absurdity of trying to get it without the efficiency factors is shown in Fig. 3. This engine (Fig. 3) is as "simple as a grindstone." A plain engine to do this work would be a freak that could not be put on any railroad. Look at the wheels, the flue length, the size of the firebox and then think of what this means. I cannot present a better demonstration.

The fuel consumption as affected by these capacity factors is shown in Fig. 4. Of course, increased power means stronger cars, longer sidings and removal of other physical restrictions which in every case are paying business propositions.

High Quality Steel Reciprocating Parts

High quality steel forgings if applied to the reciprocating parts of the United States Railroad Administration heavy Mikado locomotives reveal an interesting possibility. Both light and heavy Administration Mikados were actually built with reciprocating parts of open hearth steel. The results in rail pressures which would be obtained if the heavy Administration engine had been built with high quality steel reciprocating parts of light weight are shown in Fig 5. The first sets of figures show the rail pressures of the light Mikado with open hearth reciprocating parts at rest and at different speeds. The lower figures in each case show the rail pressures of the heavy Administration Mikado if fitted with light parts of high quality steel. These are shown at rest and at speeds of 35, 40, 45 and 55 miles per hour. At speeds between 40 and 45 miles per hour the light Mikado becomes more destructive to the track because of driving wheel pressures than the heavy Mikado when equipped with light reciprocating parts. In other words, at all speeds where the engines are likely to damage the track the heavy Mikados with light parts are safer engines than the light Mikados with heavy parts. In this comparison, it should be borne in mind that the heavy Mikado has 10 per cent more tractive power than the light one and 14 per cent more heating surface. The total weight of the heavy Mikado is 9½ per cent greater than the light one. As railroad officers with track and bridge responsibilities, which engine would you choose? Remember that the heavy one has 10 to 15 per cent greater capacity than the light one.

Stokers

Locomotives of greatest power when coal is the fuel have passed the physical capacity of the fireman to maintain steam enough to supply the large cylinders that present operating conditions demand. As the result of development in the severest service known, mechanical stokers are ready not only for present needs but they provide reserve capacity for years to come. In considering the stoker, the chief question is one of increased capacity to get the power from the tender to the grates, in order to get the greatest loads over the road at the least cost. The vital question is the provision of the horsepower at speeds that bring economy in use of tracks and yards and economy in the application of high wage schedules and prohibitive overtime. The stoker development began at about the right time to be ready for power demands that are coming. Power stokers emancipate the big locomotive from the limitations of the human fireman. They render it possible to operate locomotives that require too much coal for the ablest of firemen to handle. They also provide means for getting higher horsepower out of engines at high speeds than otherwise would be possible.

Air Brakes

Air brakes have increased the capacity as well as safety of railroads. By improved brakes alone the capacity of the New York Subway was more than doubled. Without highly efficient air brakes heavy trains could not be run at all. This great subject is merely mentioned here, but it must be considered in connection with the future because today the improved equipment of brakes is in the lead of common practice.

Look Forward

New locomotives are going to last almost indefinitely when kept up-to-date as to modernizing. They lose their useful lives only by obsolescence. The design of new equipment is therefore of the utmost importance and someone on the road should be charged with the responsibility of looking ahead and determining what new engines are to be, long enough in advance to be sure that they absolutely fit conditions as they are and that they will fit as nearly as may be conditions that are to come. This involves a deep study of operation in all its phases. It seems obvious that the general manager or operating vice-president would find his job much easier if every new engine built should receive the same attention that the building of every new big bridge receives. But bridge design is a routine. Locomotive design is improving so fast that most of us cannot keep up with it. The new engine question in itself is a big task, offering great possibilities.

Then comes the question of the existing power and what may be done to it to increase its capacity, increase its pulling power, reduce its failures on the road, to quicken and cheapen the maintenance work and to increase its thermal efficiency and the number of hours that it is available. This involves intimate knowledge of progress in machine tools, in labor-saving equipment, in equipment of locomotive terminals and particularly equipment for running repairs at the round-

houses. Some of the roads are approaching this ideal now. The roads which come nearest to doing it are those which are making best use of their power, and which are in the best shape financially.

The kind of problems which need working out are represented by a study of locomotive drawbar pull which will show whether it is cheaper to increase the power of locomotives or to cut down a certain grade. The money value in reduced cost of operation due to reducing certain grades is already well worked out. It is practically reduced to a formula, but the effect of increased drawbar pull needs to be reduced to a formula. This would at once reveal the money value in operation of increasing the drawbar pull of a Mikado by 50 per cent at a speed of 30 miles per hour or by nearly 30 per cent at 20 miles per hour. Another study of great value is that of considering available drawbar pull hours of locomotives as if it were a deposit in the bank. Figures that show how much of this deposit is used under daily conditions and how much it can be increased by relatively small expenditures offer a promising field for saving.

Because of the improvements of 20 years the locomotive, its construction, its operation and its maintenance presents the trump card in the reduction of the cost of transportation in the present emergency. That card has been well played, play it now to win.

In conclusion there are two very important points which I do not wish to leave either unsaid or unheeded:

First: In emphasizing the importance of all these items of modernizing, of vitalizing, locomotives we have discussed tonight, I wish to make most prominent the first and greatest obligation of the railroad companies, namely, their responsibility to their owners and stockholders, who first and above all others are entitled to a fair return upon their investments.

Second: As I have already attempted to point out railroad managements have done and are doing wonderfully well in the application of capacity increasing factors to locomotives to augment power. These improvements will by necessity result in substantial savings. There are, however, additional means of economy which are not so closely hooked up with pure problems of capacity increase. These must be further considered by themselves. Funds for carrying out programs in this direction will be made available quickly when the possibilities and necessities are fully appreciated.

Freight Claim Division Plans to Reduce Losses

Organization Contemplates Active Campaign to Arrest Increase in Payments for Loss and Damage

PREVENTION WAS THE KEYNOTE of the Thirtieth Annual Convention of the Freight Claim Division of the American Railway Association (formerly the Freight Claim Association), which was held at the Hotel Sherman, Chicago, from May 17 to 19. The meeting was featured by the setting aside of an entire day for the discussion of causes of, and means for preventing freight claims. It was the first time in the history of the organization that any part of its annual session had been thus set aside for a special order of business centering around claim prevention, and the interest which was manifested, as well as the presence of numerous representatives of the operating departments of the roads, who had been invited to attend, indicated clearly the general realization that the sum of $109,000,000 paid out in claims in 1920, must be materially reduced. Especially noteworthy was the fact that the 350 representatives of the claim departments of the carriers who attended did not limit their prevention campaign to a discussion, but followed it through with a complete analysis of the causes of the situation, together with recommendations for bettering it.

Following the usual custom, the opening day of the meeting was given over to committee reports and other routine business. The convention was called to order by H. C. Pribble, general claim agent of the Atchison, Topeka & Santa Fe, and chairman of the Freight Claim Division, who emphasized the importance and seriousness of the problems confronting the meeting in his opening remarks. Upon the recommendation of its executive committee, endorsed by the Committee on Rules and Order, the Freight Claim Association voted to incorporate formally in the American Railway Association. By this action the former Freight Claim Association becomes Division VII, Freight Claim Division, of the American Railway Association. Its assets were turned over to the A. R. A. and its members were accorded full voting privileges in the latter organization.

Freight Claim Prevention Most Important Topic

It was obvious from the unusual attendance at the second day's session, that notwithstanding the interest in the amalgamation with the American Railway Association, the special order of business was claim prevention. The necessity for an organized claim prevention campaign was emphasized by R. H. Aishton, president of the American Railway Association, who addressed the session in the absence of N. D. Maher, president of the Norfolk & Western and representative of the Freight Claim Division on the Board of Directors of the American Railway Association. Mr. Aishton stated that the Division had made an excellent start toward a reduction in the heavy drain on revenues caused by freight claims, especially in view of the generally run down condition of equipment following federal control, the switchmen's strike of a year ago, and other serious obstacles with which it had been confronted.

President Aishton was followed by Francis C. McAdams, assistant director of accounts of the Interstate Commerce Commission, who presented the views of that body on the claim prevention movement.

Campaign Already Under Way

That the interval since the last session had been utilized in preparing and launching the prevention campaign, was brought out in the report of the Committee on Cause and Prevention, which was presented by the chairman, J. B. Baskerville, assistant general claim agent of the Norfolk & Western. The outstanding feature of the year's effort was the employment of three special claim prevention representatives, to devote their entire time to the work.

In connection with the report of the Committee on Cause and Prevention, it had been decided that the task of analyzing and recommending means of preventing the main causes for claims, in view of the large general session, would be facilitated if the more important subjects were grouped for discussion into five general classes, as follows: *I.* Robberies, resulting in losses of nearly $2,000,000 per month; *II.* Loss of Entire Packages, costing approximately $1,500,000 per month; *III.* Rough Handling, responsible for claim payments of about $1,000,000 per month; *IV.* Defective Equipment, involving a cost of slightly less than $1,000,000 per month;

V. Delay, resulting in charges of approximately $500,000 per month.

Aside from the specific recommendations on each of these subjects, two outstanding facts were developed during the session. The first was that excellent results were to be derived from frequent meetings of employees and officers on individual roads for the discussion of prevention of loss and damage claims. Investigations in this connection disclosed that only 57 per cent of the roads of the country were properly organized to interest their employees in investigating and helping to cut down claims. It was the consensus of opinion of those present that strenuous efforts should be made to secure the active co-operation of every carrier in the claim prevention movement. A second feature of the special session was the launching of a movement to secure closer co-operation in the settlement of important claims between the carrier on whose lines shipments originated and the carrier called upon finally to settle the claim.

Robbery and Lost Packages

The subject of robbery, which, it developed, is resulting at the present time in a more serious loss to the carriers than ever before, was discussed at length. It was brought out that the increasing number of depredations was due in large measure to the widespread unemployment at the present time, coupled with the leniency of the courts. It was further established that the pilferers were not confined to any special class of persons, but were in the service of carriers, draymen and shippers alike. The session recommended that the president of the American Railway Association be petitioned to impress the seriousness of the situation upon the various railroad executives throughout the country. It was further recommended that the protective sections of the various carriers be further strengthened at the present time rather than curtailed, in order that freight, as well as the large amount of idle equipment, be amply protected.

The Division agreed that the serious drain resulting from lost packages was due principally to the large number of these packages which go astray and, in consequence, are never recovered. To remedy this difficulty, three proposals were laid down:

1. The carriers should require proof of ownership on astray packages at destination.

2. Notice should be sent to all lines at destination point of the delivery of astray packages.

3. The delivery should be "followed up" to secure revenue billing, in order that the line "short" might be fully advised of the delivery of the "over."

Rough Handling Discussed

The subject of rough handling was brought before the session from a new angle by J. L. Pilcher, mechanical engineer of the Norfolk & Western. Mr. Pilcher illustrated by charts the result of tests which indicated that cars in switching must not be brought together at a speed greater than two miles an hour. It was claimed that the movement at the time of contact can be brought down to this speed, although representatives of the operating departments who were present declared that this practice would slow up operation. The subject of rough handling was referred by the session to the Mechanical, Transportation and Operating Divisions of the American Railway Association for further consideration, in view of the fact that the theory outlined was new and somewhat drastic, and pertained especially to the work of the other Divisions.

Defective Equipment and Delay

Delays, it was established, are not a serious cause of claims at the present time. Those present agreed with representatives of the operating departments, that freight in general is now moving practically on schedule time. In the same way the meeting held that the subject of defective equipment could well be deferred until the financial condition of the carriers had improved. The sense of the meeting was that equipment had been allowed to run down in many instances during federal control, and that claims resulting from that cause could be reduced only as a favorable opportunity for placing equipment in good condition was again presented.

Election of Officers

The remainder of the session was devoted to outlining the claim prevention campaign for the coming year when a determined effort will be made to reduce the bill for loss and damage claims materially.

The final day of the meeting was occupied with committee reports and with the election of officers. H. C. Pribble, chairman of the Freight Claim Division during the past year, was re-elected. H. C. Howe, freight claim agent of the Chicago & North Western, was re-elected first vice-chairman; W. C. Fitch, freight claim agent of the Southern Pacific, was elected second vice-chairman; Lewis Pilcher was re-elected secretary, and J. B. Baskerville was re-elected chairman of the reorganized Committee on Freight Claim Prevention. These officers were also appointed members of the General Committee of the Division. In addition to the officers, the following were elected members of the General Committee: R. L. Calkins, freight claim agent, New York Central; J. A. Beahan, freight claim agent, New York, New Haven & Hartford; W. B. Kellett, freight claim agent, Fort Worth & Denver City; T. S. Walton, freight claim agent, Missouri Pacific and H. R. Grochan, freight claim agent, Chicago, St. Paul, Minneapolis & Omaha.

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There Are Some Folks Who Are Beginning to Wonder How Much Longer That Orchestra Is Hired for

Annual Convention of Fuel Association

Papers on French Fuel Conditions, Pulverized Coal and Feed Water Heaters at Opening Sessions

WITH AN ATTENDANCE of approximately 200, the International Railway Fuel Association opened its thirteenth annual convention at the Hotel Sherman, Chicago, on May 24 and adjourned after the consideration of a heavy program on May 26.

Following the usual opening exercises the meeting was addressed by Samuel O. Dunn, editor of the *Railway Age*. An abstract of Mr. Dunn's address follows.

Present Railway Situation

By Samuel O. Dunn

The fuel bill of the railroads, like all their other expenses, has increased very greatly within recent years. In the year ended on June 30, 1915, the fuel used by the Class I railways cost them less than $210,000,000. In the calendar year 1916 it cost them over $250,000,000, in 1918 it cost them over $500,000,000. There was a decline in the amount of traffic handled and in total expenditures for fuel in 1919, but in 1920, owing to increases both in the amount of fuel consumed and in the average price, the total fuel bill of the Class I roads was $675,000,000. This was an increase since 1916 of $423,000,000, or almost 170 per cent. This increase in the cost of fuel was partly caused by an increase in the amount consumed, due to the fact that a larger traffic was handled, but much more largely by increases in the price of fuel. A large part of the increases in price took place last year. In the last four months of 1919 the average price per ton paid by the railroads for fuel was $3.42, while in the last four months of 1920 it was $4.74, an increase of 39 per cent in twelve months.

Since the end of 1920 there have been substantial reductions in the prices paid by the railroads for coal. It is clear, however, that further reductions must be secured in all their operating expenses, including the cost of fuel. The cost of fuel must be further reduced both by reductions in price and by the effecting of greater economies in its use. The effecting of greater economies in its use must be brought about by securing greater efficiency in the firing of locomotives and also by continuance of the installation of devices which result in less fuel being burned in proportion to the power produced.

I have touched upon this phase of railroad operation because it is the one in which the members of your organization are most directly interested. Speaking now of the general railroad situation in this country, it is at present in some important respects the worst that it has ever been.

Passenger and freight rates are higher than for many years. There is complaint from many travelers and shippers that they are too high. In spite of these relatively high rates, the railways as a whole never in any month since the rates were fixed have earned the net return it was expected they would. Recently most of them have not been earning enough to pay their operating expenses and taxes, and have seemed headed for bankruptcy.

There is at present a very large surplus of freight cars. It is well known, however, that the present capacity of the railroads have proved unequal, when production and commerce have been active, to all the traffic offered. How are the railways to handle the unprecedentedly large traffic they are bound to be offered within the near future unless, meantime, their capacity is increased?

In the railroad as in other businesses, new capital is needed for two purposes. One of these is to increase the amount of business that can be done. The other is to reduce the cost of doing the business. When new investment is wisely made in a railroad or any other enterprise, such as a manufacturing concern having a large plant, it increases the interest and dividends that must be paid. But by saving labor and in other ways it reduces the operating expenses that must be incurred more than it increases the capital charges, and, in consequence, tends to enable the concern to make larger profits, to reduce the prices it must charge, or both. The main reason why for years most of the railways of this country were able, despite steadily advancing wages and other costs, to increase their own profits while making lower and lower rates was that they were constantly investing large amounts of new capital in improvements for the express purpose of reducing or holding down operating expenses. The reduction of the net return of the railways by government regulation reduced the amount of new capital they could raise. This, in turn, reduced the improvements that could be made and greatly impaired the ability of the managements to effect operating economies.

On March 1, 1920, the railways were returned to private operation. During government control the operating expenses had continued to increase rapidly right down to the last day of government control. In the very last month of government control the railways failed at the rate of $270,000 a day to earn enough to pay their operating expenses and taxes, leaving nothing with which to pay the government guarantees. Within a few months the Railroad Labor Board, a government body, granted the largest advance in wages ever made to a single class of working men at one time in the history of the world. The prices of fuel and materials were advancing, and within a few months attained higher levels than during the war.

The Interstate Commerce Commission granted an advance in rates late in August. Although the railways were handling a record breaking business, the rates failed from the start to yield the net return expected. In consequence, in the last four months of 1920, when the railways handled the largest traffic ever known in those months, it cost them 88 cents of each dollar they earned to pay their expenses and taxes, and the net return earned was at the annual rate of only 3⅓ per cent instead of 6 per cent.

While the railways were in the precarious position financially these figures indicate there began a large slump in traffic. Not only were net earnings wiped out, but beginning in January and February the operating expenses and taxes, in spite of great retrenchments, exceeded the total earnings.

Nobody connected with the railways believes or has contended that all the reductions in the cost of operation should be made in the payroll. The railways contend, however, that the payroll is excessive, that it is the main reason why the operating expenses are excessive and that the main reasons for the excessive payroll are that, first, rules and working conditions adopted under government control have reduced the efficiency of labor and forced the railways to employ too many men, and, secondly, that the basic wages of railway employees are too high.

The Railroad Labor Board has ordered the National Agreements abrogated on July 1, subject to certain principles which it has laid down. The labor union leaders have announced that they will draft and submit to the individual

railways throughout the country a set of uniform rules and working conditions, and they undoubtedly will make a strong effort to get these adopted. No uniform set of rules and working conditions could be applied throughout the country without causing great inefficiency and waste. The benefits that will be derived from the decision in the National Agreements case are, therefore, yet to be determined.

In addition to seeking abrogation of the National Agreements, the railways have asked the Railroad Labor Board to make general reductions of wages. They base their application mainly upon the grounds that wages have been reduced in most other industries and that the cost of living has declined.

The principal answer of the labor leaders to this argument is that through mismanagement the railways are wasting about $1,000,000,000 a year, and that all this alleged waste should be eliminated before the payroll is curtailed.

After the present wages were fixed, and when the railways were still carrying a heavy traffic, their total operating expenses were running at the rate of about $6,000,000,000 a year, and of this amount almost $4,000,000,000 was going to labor in wages, leaving about $2,000,000,000 for other expenses. Since the labor leaders defend the present payroll, it follows, on their theory, that, by eliminating preventable "wastes" the managements could and should reduce all expenses except the payroll by almost 50 per cent. At least four-fifths of this other $2,000,000,000 of railway expenses consists of expenditures for fuel and for equipment and materials and supplies—iron and steel, lumber, office appliances, stationery, etc. The labor leaders claim the railways pay excessive prices for these things because the railways are under the same financial control as the concerns from which they make purchases.

It would be easy to prove, if time permitted, that all this talk about the control of railways and the concerns from which they make purchases by the same financial interests is the wildest buncombe. But suppose they are under the same control. Where is the evidence that this causes the railways to pay excessive prices for fuel and for materials and supplies? Do they pay more for coal than other large consumers? The coal operators complain loudly that the railways use the "assigned car" rule to get coal cheaper than other concerns. Do they pay more for iron and steel? Until recently they, like other consumers, were paying the United States Steel Corporation, which is supposed to be the archtype of a concern controlled by the house of Morgan, the same prices which were fixed by a government board in 1919, and which other people were paying; and they are now paying it and other steel concerns less than these prices. Do the railways pay more than others for lumber? Every lumber manufacturer and dealer will say they are close buyers. The allegation that the railways as a whole, because of their actual or alleged financial control, waste money by intentionally paying excessive prices has never been supported by a scintilla of evidence, and it never can be, because it is absolutely baseless.

The labor leaders also criticise the railways for not having made certain important improvements in their physical properties which would enable large economies to be effected. To make large economy-producing improvements the railways must first raise large amounts of new capital to invest in them. But they cannot raise this new capital until they are enabled to earn a net return sufficient to pay reasonable interest and dividends on their present valuation. Their net return cannot be made adequate for this purpose without large reductions of their present expenses, of which the payroll constitutes two-thirds; and the labor leaders oppose all reductions of the payroll.

The Railroad Labor Board has definitely announced that reductions of wages will be made which will be effective on July 1. It has not, however, indicated how large these reductions of wages will be.

It is very doubtful if we shall ever return to pre-war wages and other expenses, or to pre-war rates, and highly probable that it will be a long time before we even approach them. The great war has made profound changes in economic and social conditions throughout the world, and also in man's thinking and in the relations of different classes of men to one another; and until you have restored, if you ever shall restore, pre-war conditions, pre-war ways of thinking and pre-war relationships between employers and employees elsewhere, you cannot hope to restore them on the railroads of this country. What we can do and must do on the railroads is to deal more justly with labor of many classes than formerly was done with respect to both wages and working conditions and at the same time make the railroads once more an instrumentality which can and will render their service to the public with a high degree of efficiency and economy.

I have not the slightest idea that the pre-war wages of railway employees ever will be restored, nor do I think they ever should be. There were many classes of employees who, before the war, were not paid as much as they should have been in proportion to the cost of living at that time, and I hope to see their wages in future kept higher in proportion to the cost of living than they were before. And in this connection I think special reference should be made to the cases of supervisory officers. It is a fact today, as it has been for years, that many supervisory officers are paid less than the higher paid employees over whose work they exercise supervision. Indeed, the average salary of all division officers, including superintendents, master mechanics, trainmasters, road foremen of engines, etc., is less than the average wages of some employees. According to the latest available statistics the average salary of all division officers now average $3,437 per year, while the wages of passenger locomotive engineers average $3,450 and the wages of freight engineers $3,586. The advances granted to divisional and supervisory officers since before the war have been relatively much less than those granted to most classes of employees, and as a matter of justice to the officers this fact, together with the fact that many of the officers were underpaid before, should be given great weight in any readjustments which may be made in future.

Bad as the situation is today, I am not pessimistic about the future of the railways. On the whole, I have no doubt that we have seen the worst we are going to see in the railroad business.

However, we should clearly recognize the fact that if the railroads are again to be put upon their feet the utmost efforts must be made by all of us who are directly interested in the business, first, to secure the utmost efficiency and economy of operation, and, second, to keep the public fully informed regarding everything that is being done to promote efficiency and economy, in order that the many unjust attacks which will continue to be made upon the managements of the railroads in the future, as they have been in the past, will not mislead public opinion regarding private management. All of us who are in close touch with railway affairs know that private management is by no means perfect, but we all have very good reason for believing it is much better than government management or Plumb plan management would be, and, therefore, it is our duty to do all we can to make sure that private management will be perpetuated.

President Hurley's Address

Following Mr. Dunn's address, J. B. Hurley delivered the presidential address, of which an abstract follows:

The occasion that bids us gather in convention at this time is indeed an important and impressive one. Many great and perplexing questions confront the mind of America to-

day and call for settlement—never probably in the history of the nation was there a time when loyal citizenship and patriotic co-operation on the part of all for the good of her institutions, for the maintenance of her business enterprises and for a respectable moral standard was more desired than at present. War with its horrors and sacrifices brought extravagance. The emergencies of the times to a great extent broke down our systems of economy and an extravagant increase in material, in production, in labor was a natural outcome of urgent necessity.

The war has ended, but it has left its impressions and its deadly influence—excessive profits and wages of war times have brought a spirit of unrest and discontent to the minds of those who in their loyalty are asked to practice economy that our business interests may prosper, that we may take our place even with keen competition, not only as the first nation of the world by our wealth, but first as an industrial and commercial nation. This is the prime object of our convention—that we may bring about a better feeling and spirit between employer and employee, that we may win the employee by interesting him in his work and making him feel that work is rather a pleasure than a crime—that we may better the employee by educating him to know and understand his work that he may do it well, and hence, be a source of satisfaction and interest to his employer.

That by so working, the employer may know and understand that the work of the employee is of first interest to the employer and that he concern himself in working for and bettering the working and home comforts of his employees when consistent. A spirit of mutual interest between employer and employee is an absolute necessity if our business is to prosper and grow.

At the close of Mr. Hurley's address the report of the secretary was read, showing a membership of 1,311 members at the close of the calendar year 1920.

Report of Committee on Pulverized Fuel

The progress of the art of burning pulverized coal by railroads on locomotives or in stationary plants the past year has, on account of well understood economic and other conditions, been practically nil, no new installations having been made.

Some few tests have been made. One of these which is of some interest was made on Lehigh Valley locomotive No. 1360 between Easton and Lehighton, Pa., to determine the practicability of burning pulverized North Dakota lignite containing 15 per cent moisture and Red Lodge sludge (Montana sub-bituminous coal) without resulting in serious honeycomb formation or unusual disintegration of brick work.

The results were successful with the exception of the honeycomb formation which with either coal developed rapidly on the back flue sheet when the locomotive was worked hard and seriously hampered operation. The committee suggests that this honeycomb formation be not taken too seriously and believes that with proper research and engineering work to determine the coal characteristics and to develop proper design of boiler and firebox with particular reference to combustion area and also to drafting, that this problem can be solved. In connection with drafting the committee has in mind the elimination of pulsating draft and correctly determined air supply.

In stationary practice two new cases of pulverized coal operation have been called to the committee's attention. The Milwaukee Electric Railway & Light Company during the past year completed and put into operation a new power plant at St. Francis, near Milwaukee, Wisconsin, manifesting their confidence in the economic advantages of burning pulverized coal.

The Oklahoma City plant of Morris & Company, originally equipped with chain grates, has been modified to burn either pulverized coal or oil and has been in successful operation for a little over a year. By the use of suitable burners it is practicable to burn either pulverized coal or oil without changing furnace or boiler. The coals used are Macalaster Field having a B. t. u. value of 10,000 to 11,500; moisture, 5 to 10 per cent; volatile matter, 20 to 30 per cent; fixed carbon, 40 to 45 per cent; ash, 30 to 35 per cent; sulphur, 1 to 2 per cent, and Texas lignite having a B. t. u. value of 6,000 to 7,000; moisture, 30 to 35 per cent; volatile matter, 20 to 25 per cent; fixed carbon, 25 to 30 per cent; ash, 10 per cent.

This plant is reported as being particularly economical in cost of operation, showing an 8 to 10 per cent saving in cost of steam production based on MacAlester coal, over the stoker fired boilers burning coals of equivalent B. t. u. values. Accurate daily records of cost are maintained for purposes of comparison.

The state of the art today indicates an unquestionable field for pulverized coal and that its commercial use depends upon the economic conditions obtaining, each case requiring its own particular analysis.

The committee repeats its previous recommendation that thorough research and engineering work accompanied by conclusive tests be conducted at one of our universities adequately equipped, particularly in connection with the burning of pulverized coal on locomotives, the work to be supervised by competent men representing the railroads and the university.

The report is signed by W. J. Bohan (Nor.-Pac.), chairman; H. T. Bentley (C. & N. W.); R. R. Hibben (M. K. & T.); H. Piollet (Lehigh Valley); W. G. Squires (N. Y. N. H. & H.); J. M. Nicholson (A. T. & S. F.); L. R. Pyle (Locomotive Firebox Co.); W. L. Robinson (B. & O.), and E. C. Schmidt (North American Co.).

Discussion

Alonzo G. Kinyon (Fuller Engineering Company) expressed the opinion that it would not be many years before as high as 50 per cent of the coal burned would be in a pulverized form, this statement applying particularly to industrial and power plants. He said that the locomotive, as at present designed, was not well adapted to burn pulverized coal under all of the conditions it is called on to meet. Thus far nothing has been developed which will eliminate trouble from honeycombing, with certain coals when the locomotive is working at high capacity.

Eugene McAuliffe said that it is yet to be proved whether a kilowatt-hour is produced with fewer heat units from pulverized coal than from coal burned on grates, but laid stress on the versatility of pulverized fuel burning equipment where relative valves of oil and coal call for frequent changes from one to the other.

Locomotive Feed Water Heating

The interest in feed water heaters in America is shown by the history of the past year to be growing, in that the number of roads to take up the two main types of feed water heaters for tests has increased. There are no new feed water heaters brought out this year, but progress has been made in the simplification of the design of the Locomotive Feed Water Heater Company and Worthington systems.

In 1920 there were seven roads using the Locomotive Feed Water Heater Company, Weir, Worthington, Caille, and the Simplex Blake-Knowles feed water heaters. There are now eighteen American roads with five types of heaters on order or in service; namely, the Locomotive Feed Water

Heater Company, Weir, Worthington, Caille, and the Simplex Blake-Knowles. These are as follows:

The Superheater Company's Feed Water Heater:	
Delaware & Hudson	2
New York Central	4
Delaware, Lackawanna & Western	1
Ft. Smith & Western	2
Grand Trunk	1
Erie Railroad	5
Canadian Pacific	1
New York, New Haven & Hartford	5
Atchison, Topeka & Santa Fe	2
Southwestern Pacific	4
Central Railroad, New Jersey	1
Central Vermont	2
Chicago & North Western	2
Lake Shore & Michigan Southern	1
Elgin, Joliet & Eastern	2
Total on order and applied	35
Worthington Feed Water Heater:	
Pennsylvania Railroad	4
Norfolk & Western	1
Southern Pacific	5
Chicago & North Western	2
Total on order and applied	12
Weir Feed Water Heater:	
Canadian Pacific	1
Southern Railway	2
Grand Trunk	1
Total on order and applied	4
Caille Feed Water Heater:	
Baltimore & Ohio	1
Simplex Blake-Knowles Feed Water Heater:	
Erie Railroad	3

The Southern Pacific is trying out some of both the open and closed types of heaters. The roads which have tested out these heaters are securing practically the same results as given in the results of tests of the two classes of heaters, a saving of between 13 and 15 per cent based on increase in evaporation of pounds of water per pound of oil. However, in bad water districts it has been found necessary to clean the closed heaters due to scaling, in order that this saving be maintained. No data are available in bad water districts of the Worthington heater. Several means have been tried for the cleaning of the closed type of heaters, and it is believed that satisfactory means at low cost have been secured using a dilute solution of hydrochloric acid, but service alone can determine the life of the feed water heaters and flues.

The question of weight on drivers has to a certain extent influenced the adoption of the feed water heaters as at the present time the railroads have this problem to contend with, and in order to keep the weights of the locomotives within the bounds prescribed by their various roads, this valuable method of saving fuel has not been universally adopted.

The report is signed by E. E. Chapman (A. T. & S. F.), chairman; E. A. Averill (The Superheater Co.); O. S. Beyer, Jr.; B. J. Farr (Gd. Tk. Wn.); F. Kerby (B. & O.); A. T. Pfeiffer (N. Y. C.); L. G. Plant (Ry. Review); L. R. Pyle (Locomotive Firebox Co.), and W. H. Winterrowd (Can. Pac.).

Discussion

Eugene McAuliffe expressed the opinion that feed water heating had proved an effective means of reducing fuel consumption and the application of such devices is now only a question of obtaining the necessary capital.

J. N. Clark (Southern Pacific) described the results of feed water heater tests which showed that in some cases the heaters, raised the temperature of the water up to 255 deg. F. He stated that the maintenance of the heater needs to be carefully considered, especially in bad water districts where it requires frequent cleaning because the savings largely disappear when scale forms on the surfaces.

E. E. Chapman stated that the saving in various tests range from 8.4 to 16.6 per cent. He pointed out that feed water heaters reduce the rate of combustion and thus lengthen the life of boiler tubes and firebox sheets. It has been found advisable on the Santa Fe to clean the heaters every two weeks with a diluted solution of muriatic acid. This operation requires about two hours and is effective in removing scale.

Report of the Committee on Storage Coal

There has been very little activity in connection with the storage of coal by railroads since the last report of the Storage Committee.

The Fairbanks, Morse Company report of the completion of three locomotive coaling stations, including yard storage of coal, built for the Erie. At Salamanca, New York, the coaling station consisted of four circular concrete bins of 1,000 tons' capacity and tributary storage for 38,000 tons. A similar plant was built at Hornell, New York, with tributary ground storage for 33,000 tons. A 300-ton coaling station was also built for the Jacksonville Terminal Company at Jacksonville, Florida, where 300 tons is stored in overhead pockets and 2,500 tons on the ground.

All of these plants were of the drag scraper type which has been largely used by the Southern Railroad and has been described in previous reports of the committee. As to cost of operation of such plants, F. P. Drinker, manager, engineering department, Fairbanks-Morse Company, says that in 1914 observations of the operation of some of the plants on the Southern Railway showed that the cost of handling coal in and out of yard storage, including power and supplies and maintenance, averaged about 2½ cents each way, or 5 cents per ton, delivered to locomotives, and that this would indicate on the same basis a handling cost of from 10 cents to 12 cents per ton at the present time.

The Roberts & Schaefer Company report the development of a new type of storage in connection with the Rand portable coaling and cinder plant.* This type of coaling and storage plant may be equipped with a large capacity hoist or a small capacity hoist. A price for the structure complete above the rails and electrically operated, is quoted as follows:

For large capacity hoist	$36,670
For small capacity hoist	34,490

No figures are available at this time for the cost of operation of the storage portion of this plant for it is difficult to obtain separate storage figures as many of the railroads do not attempt to separate storage and coaling costs.

The Portable Machinery Company, Passaic, New Jersey, reports an installation of portable conveyors for the Atlantic Coast Electric Railway, Asbury Park, New Jersey. The pile contains about 3,000 tons and the Atlantic Coast Electric Railway reports that it can store 350 tons a day with four men unloading and attending the conveyors. The company reports that during the past two years it has built up a similar pile at four different times and later removed it to the station. At the other end of the power plant the company has a similar storage pile.

The last report of the committee† included a circular upon coal storage sent out by the Fuel Department of the Railroad Administration to all of the railroads of the United States. This was prepared under the direction of Eugene McAuliffe and a committee of railway representatives. Mr. McAuliffe reports, that "No definite information regarding the outcome of the storage circular is available. Personally I have heard but one comment, that 'Railroad officials with few exceptions paid little attention to the circular.'"

Depleted stocks of railroad fuel are particularly significant to the general consumer because they point to the probability that the railroads will have to confiscate coal or assign cars freely, measures which necessarily interfere with the regular deliveries of coal to other users. Stocks of railroad fuel were far below those held by the railroads at any time during the last four years.

The Consumers' Fuel Company, Morgantown, W. Va., built in 1920 a Thornley storage plant. A number of inquiries in regard to storage of coal at the mines have been

*This plant was described on page 607 of the March 15, 1921, issue of the *Railway Age, Daily Edition*, and illustrated on page 644 of the issue of March 16.

†See page 1311 of the May 30, 1919, issue of the *Railway Age*.

received, but a number of companies that have investigated the subject have concluded that such storage is not advisable unless an increased car rating may be obtained by the mining company as a result of such storage facilities. The general public and the large users of coal should have impressed upon them the fact that storage at the mine is not of any particular assistance to the railroads or to the consumers of coal in providing coal under emergency conditions, but acts merely as a safety valve upon operating conditions at the mine. The proper place to store coal to relieve the railroads and the consumer is as nearly as possible to the point of consumption.

In a circular issued by the United States Geological Survey under date of March 27, 1921, entitled, "Are We Buying Coal Enough?" Doctor George Otis Smith, director, and F. G. Tryon, coal statistician, summarize the present condition as follows:

"In so far as the consumer is waiting for the price to come down, at the risk of depleting his reserves against winter requirements, the relief turns upon a question of fact, namely, whether the present market price of coal is a reasonable price, whether it is as low as can be expected later. It is to be regretted that the Federal Trade Commission has been enjoined from learning the facts and so is not able to issue a statement of present-day costs that would enlighten the public.

" 'But only as needed,' may prove too conservative advice at this time. The consumer waiting for low prices and the producer delaying price adjustment might be found equally responsible for the uneconomic seasonal fluctuations in coal output. 'Buy only as needed,' may result in cheaper coal in the bin, but the bin may be too nearly empty much of the time when the need is greatest."

The necessity for the storage of coal was stressed in a set of conclusions prepared by the Committee on the Stabilization of the Bituminous Coal Mining Industry of the American Institute of Mining and Metallurgical Engineers, which may be summarized as follows:

(1) The bituminous industry, by the nature of its organization, functions economically in a too inefficient manner. Employment in the industry averages less than 220 days per annum, with a minimum district average of less than 200 days.

(2) The causes are largely (a) intermittency in seasonal demand, (b) irregularity of car supply, and (c) the lack of storage facilities and incentive for their use.

(3) The cure lies in: (a) The co-operation of railroads in the establishment of seasonal differentials in rates that will induce summer demand; (b) increased transportation facilities and a more efficient and equitable distribution of cars; (c) increased use of central and inter-connected electric-power plants; (d) lower selling prices in dull seasons made possible by differentials in profits, freight rates and wages; (e) recognition by the larger consumers, that not only continuity of operation, but also the safety of the public from the stoppage of supply, demands that they provide adequate storage to be replenished in the dull season.

(4) Such storage is feasible and can be made financially remunerative by differential rates and prices.

(5) No adequate solution can be found, except through organized co-operation of operators, labor, railroads, and large consumers..

The committee feels that one of the greatest problems is to get the higher railroad authorities to thoroughly understand the importance of the storage of coal and that they may appreciate the necessity for careful and systematic storage. Spasmodic attempts to store coal have always proven unsatisfactory both to the consumer and to the producer and that storage of coal may be successful it must be conducted regularly and in a methodical manner and by the fullest co-operation of producers, carriers and consumers. The storage proposition must be tied up with production to such an extent that it will co-ordinate properly, and when large stocks of coal have been stored the production and movement will have to be regulated in such a way that the storage coal can be used most advantageously and not become simply a high priced inventory article. The experience of the past 3 or 4 years shows conclusively that storage of coal must be more carefully considered and that only by such careful consideration can it become the stabilizing influence that it should.

If a practicable plan of storage at large distributing centers had been operating during 1919 it is probable that the November strike of that year would not have produced the condition of panic that followed during the spring and summer of 1920.

The report is signed by H. H. Stoek (University of Illinois), chairman; A. H. Davies, C. G. Hall (Walter Bledsoe & Co.); J. B. Hutchison (Texas Steel Co.); B. P. Phillippe (Penn System); R. E. Rightmire (Consolidation Coal Co.); A. P. Wells (Central of Georgia); H. Woods (Colorado & Southern); S. L. Yerkes (Grider Coal Sales Agency).

Fuel Conditions on the French Railways

By M. de Boysson, Ing.,
Chief of Locomotive Service, Paris-Orleans Railway, Paris, France

The question of locomotive fuel consumption has always been one of the greatest importance to the French railways for the cost of coal, even before the war, has been relatively high and the yearly fuel bill represents a large proportion of the total operating expenses.

In 1912 the average cost of coal used by the French railways was about 18 to 19 francs ($3.60 to $3.80) per ton loaded on the cars, and about 21 to 22 francs ($4.20 to $4.40) per ton delivered on the tender, including the cost of freight and handling. In 1914, on the eve of the war, these prices had increased some 60 or 80 cents per ton, and at that time the cost of fuel for the French railways amounted to about one-sixth of their total operating expenses.

The average price of French coal and imported coal was, in 1920, more than 250 francs ($50) per ton. Furthermore this increase in price was accompanied by a decrease in quality. The amount of ash, which in ordinary times averaged from 8 to 10 per cent, rose to an average of nearly 17 per cent. This naturally caused an increase in fuel consumption. At the present time the French railways are, therefore, paying about fifteen times the pre-war cost for fuel and the total fuel bill now amounts to about 35 or 40 per cent of the total operating expenses as compared to about 16 per cent before the war.

Under these circumstances it has been necessary for the French railways to give careful attention to the fuel consumption and the price of fuel. They have concentrated principally on the three following points to obtain fuel economy: choice of fuel, improvements in the locomotive to improve fuel consumption, and training of the engine crew and supervision of fuel consumption.

Unfortunately, in spite of the increase in price, it has not been possible to accomplish much in the direction of economy. The reason for this is due to the scarcity of coal, the difficulty of obtaining sufficient supplies of all kinds to provide the proper mixtures, and the fact that a large number of inexperienced men have had to be employed to replace the men lost in the war.

Choice of Fuel

The destruction of the mines in the North and the Pas-de Calais districts, greatly reducing the coal resources of France, no longer permitted the railways to choose the fuel best suited for locomotive use and they have had to be satisfied with what they were able to obtain. Furthermore, the

decrease in the amount of coal carried in stock has forced them to burn the coal as it arrived without permitting them to make mixtures, as had been done in the past, which would give the best results. The situation has, however, improved a little during the past few months and the railways are gradually returning to more economical methods.

Before the war it was the practice of the railways to mix coals of various qualities in order to provide a mixture which would give the most economical results, taking into account the cost and consumption. By this means the railways were able to use a fair proportion of coal of inferior quality, containing a large proportion of dust, and fuels low in volatile which could be obtained at a comparatively low price. Such coals which would be unsatisfactory when burnt alone, gave very good results when mixed with coals of a better quality.

Another method of using this inferior coal is to combine it with a certain amount of resin to form briquettes. The French mines from which the railways draw their supplies, produce a fairly large proportion of small coal and, further, screened coal coming from abroad arrives with a large amount of coal dust caused by repeated handling. It is necessary to find a use for this small coal and dust, of which there is too large a quantity to be burned as it stands. Briquetting solves the problem and at the same time increases the supply of select coal, which is not obtained in sufficient quantities from the screened coal to meet the needs of the country. Briquettes are made by mixing 92 parts, by weight, of coal with 8 parts of resin. This mixture forms a briquette of good quality which can be used under the same conditions as the best coal, both under difficult operating conditions and for firing up. The total cost of this briquetted coal is practically the same as that of screened coal and the briquettes have the advantage in that they can be handled and stored in the open with much less deterioration than the screened coal. Furthermore, by the addition of the 8 per cent of resin, it is possible to use low volatile fuels which under ordinary conditions would be useless.

These briquettes are manufactured in special presses in which the mixture of small coal and resin, after being heated to about 250 degs. F. to give the resin a consistency of paste, is compressed at pressures of from 3,000 to 4,200 lb. per sq. in. The small coal used in the briquettes can be used just as it comes from being screened, but as a rule it is best to clean it by washing. The weight of the briquettes vary from 6 to 20 lb. The briquettes are made either at the mines or at the ports at which the foreign coal is delivered. Some railways have briquetting plants of their own.

It is the practice of the French railways to mix different grades of fuel in order to obtain the most economical combination for the locomotive service involved. These mixtures will contain more or less high grade fuel according as the service is more or less difficult. The degree of perfection obtained in these mixtures is, however, subject to the kinds and quality of coal available and the cost involved in obtaining the proper quality of coal for the ideal combination.

The amount of volatile matter contained in these coals is rather variable. The average of the mixtures have from 18 to 25 per cent volatile, but all fuel having 15 to 30 and even 32 per cent can be used. In exceptional cases even these limits have been exceeded. Coals with a fusible ash below 2,200 deg. F. are avoided as much as possible and those which produce clinkers which adhere to the grates are not used at all.

Fuel Stocks and Methods of Handling Coal

In order to obtain the proper mixtures it is necessary to have at each coaling station a fairly large stock of fuel, because regular deliveries of the different grades of fuel cannot be depended on. A large stock is still more important in districts which are supplied with imported fuel. The normal stock allowed for the railways was about three to four wecks' supply for pit coal and six weeks' to two months' for briquettes. The latter should not be used until they are dry which takes about a month after they are manufactured. The coal coming from the ports is either mixed immediately when it arrives at the coaling stations, or is placed in separate piles, if the arrivals are too irregular, and mixed in the desired proportions when it is loaded onto the locomotive.

In order to facilitate making these mixtures, mechanical methods of handling have been devised which have the added advantage of reducing the cost of handling. A complete study of the methods of handling would exceed the scope of this paper and only a few particulars of the machinery used by the railways will be mentioned.

The coal cars at the coaling stations are unloaded by steam or electric traveling cranes. A certain amount is delivered directly to the locomotive but the most of it is placed in storage for the purpose of making the mixtures, the same cranes being used in the future handling of the fuel.

At engine houses of medium size the locomotive tender is loaded with the same apparatus that is used for unloading the coal as it arrived from the source of supply. In the larger engine terminals, however, the two operations are distinct, principally because the lack of space required that the storage ground for the fuel be placed at a considerable distance from the engine houses. When the locomotive tender is not loaded directly by the means of cranes, one of the following two methods is adopted: (a) the coal is placed in small push cars, holding about 3,000 lb., and pulled up an inclined trestle by an electric hoist, where the coal is dumped directly onto the locomotive; (b) the coal is raised, either by a crane or chain buckets, into a regular coal chute from which it is delivered directly to the locomotive.

The briquettes cannot be handled with the grab buckets. The greater part of the work is done by hand, although it is possible to load them into the push cars and deliver them to the locomotive in the same manner as is described under (a) above. They are also loaded onto the locomotive by means of ordinary buckets filled by hand.

Practically all of the coal delivered to the locomotives is weighed. This does not present any difficulties when the push cars are used but when the coal is loaded onto the locomotives by the means of buckets no attempt is made to obtain the actual weight, the practice being merely to count the buckets. However, the workmen who are accustomed to doing this work are able to fill the buckets to very nearly the same weight and there is but little appreciable error.

Purchase and Inspection

On account of the various qualities and sources of supply of the coal used, it is not possible to rely upon the analyses at the mines. The contracts are therefore made for each different grade of coal, fixing the maximum amount of ash and also quantity of water in washed coal at the point at which the fuel is received. Fines or premiums are provided for coal whose maximum is above or below these figures. In the case of briquettes there is an additional cohesion test.

A maximum proportion of small coal content is specified for both screened and run-of-mine coal. There are, also, other limits which if exceeded are grounds for rejection. The quality of the coal is checked from samples taken either at the mines or at the ports where the coal is unloaded, or even at the coaling stations. These samples were analyzed in the laboratories. This system of checking was discontinued during the war, for the first consideration was to increase production. The railways are trying gradually to put it into force again.

The ordering, inspection and handling of fuel is under the control of a special department, which may or may not be under the jurisdiction of the general supply department of the railways.

Locomotive Improvements for Economical Operation

Boiler Improvements

As regards the boiler, the following have been the chief improvements:

1. The use of brick arches, while at the same time protecting the tube plate, has reduced the fuel consumption by 3 or 4 per cent. At the present time all the French locomotives are equipped with them.

2. The dumping grate and the shaking grate, while not reducing the fuel consumption, have allowed the use of inferior fuel. The dumping grate is used on all engines and the shaking grate on most of the modern engines.

3. The use of a circular exhaust nozzle, with a variable opening, gives the maximum draft with the least back pressure. Great progress has already been made in the study of the best arrangement for exhaust nozzles; new ones are still being tried. Considerable economy can be obtained by the use of a well built nozzle which is kept clean, without play and which is operated in accordance with established rules. A dirty or badly centered nozzle may increase the back pressure to a considerable degree and at the same time diminish the draft.

4. Boiler lagging is not in general use as the cost of upkeep seems to equal the saving made on the fuel. However, new trials are being made taking into account the present price of coal.

Compounding and Superheating

Compounding has realized an economy of 10 per cent compared with the ordinary engines. At first compounding was applied to two-cylinder locomotives, but they have been almost entirely given up on account of the unequal balance caused by this arrangement. All the recent compound engines have four cylinders.

The use of the superheater overcomes these difficulties and gives, in the case of powerful engines, a saving of about 12 per cent on single expansion engines and 8 per cent on compound engines of the same type. In spite of the economic advantage of compound engines with a superheater and four cylinders, the tendency at present is to return, at any rate as regards engines of average power, to simple engines with a superheater and two cylinders on account of a considerable saving in maintenance and the increased facility of operation.

Feed Water Heating

Feed water heaters using exhaust steam were tried before the war. More than one hundred engines are already fitted with this apparatus. These feed water heaters achieve a certain saving of fuel, but on the other hand there are maintenance difficulties and the question is deserving of thorough study.

Washing Boilers With Hot Water

Mention should also be made regarding the development of washing and filling boilers while they are hot. Instituted at first in order to diminish the stress of metal in the boilers and to allow the engines to be used again sooner, this process also allows, in certain cases, the recovery of the heat contained in the water of the boilers which are emptied. However, this recovery required extensive apparatus which it was out of the question to install during the war. The present prices are too high for the expected saving to compensate to a sufficient degree for the cost of the apparatus.

Stokers

Mechanical stokers have not yet been applied to French locomotives. The limitation of the weight per axle (18 tons) does not allow of boilers powerful enough to make these stokers indispensable.

Pulverized Coal

Neither has any use been made of pulverized coal, but the railways are following with close attention what is being done abroad and the trials undertaken in France, in order to be able eventually to adopt the practice more or less extensively.

Training of the Engine Crew and Supervision

The engine crew can have a great influence on economy in fuel. Therefore the hiring and training of locomotive engineers and firemen have always been closely watched by the railways. The employees start as workmen or laborers in the engine houses. After a theoretical and practical examination they can, after a certain time, be employed as extra firemen according to the requirements of the service; but they are not called firemen for a considerable time, which, before the war, was not less than three or four years. After acting for some time as firemen, depending on the aptitude of the employee, they have to undergo a more complete theoretical and practical examination to prove their fitness for the duties of locomotive engineer. Before the war a man was not made an engineer, except in special cases of those who had a more complete training, in less than seven or eight years, of which three years were served as fireman.

During the whole training period the employees are carefully supervised and placed under locomotive engineers who are particularly qualified to act as instructors. During their work the engineers and firemen are frequently accompanied by traveling engineers, who complete their instruction.

The necessity for increasing the strength of the staff very quickly on account of the requirements arising from the war and especially on account of the application of the eight-hour day, forced the railways to train the engine crews very hurriedly and to reduce the length of the term of probation, certainly to the detriment of the skill of the employees and the fuel consumption.

Premiums for Economy

It is not enough to train the engine crews; they must also be interested in producing results. To accomplish this the railways give the engineers and firemen a share in the fuel savings. A certain quantity of coal is allotted to each service, based either on train-miles or ton-miles and the saving made on the allotment is paid to the men at a contract price. The results obtained from this premium were very satisfactory. Recently, owing to pressure from the unions, a guaranteed minimum of premium has had to be assured to the men each month, whatever the amount of the premiums actually realized, and many of them have been content to draw this minimum without trying to obtain greater savings.

Road Supervision

On the one hand, the traveling engineers make sure that the engineers and firemen are getting the best possible out of their locomotive; on the other hand, by means of statements of consumption on each engine, attention is drawn to the engine crews or the services which are unsatisfactory. They are carefully watched, and, as required, the management takes action. If the fault is in the engine, it is immediately sent to be repaired.

Locomotive Maintenance

The maintenance of the locomotives is also closely watched. Strict rules as to the periodical inspection of the

engines are in force at the engine houses and supplementary inspections must also be made whenever it is necessary to maintain the engines in good condition. Provision is made in particular for the piston rings to be replaced about every 20,000 miles; but the rings are replaced before this when the wear exceeds a certain amount. The cylinders are rebored when the difference between two perpendicular diameters reaches 1.5 m.m. (.06 in.). A sharp lookout is kept in this respect at the main shops.

Assigned Locomotives

In general, each engine is assigned to an engineer who alone is to use it. This arrangement gives excellent results as regards economy in fuel consumption. Moreover, in this way more delicate and more economical machinery can be used, because it can be kept in better order. Naturally, this method requires a large number of engines. However, the difference is not so great as might be supposed at first sight, for the better care the engines receive greatly reduces the number of engines held out of service for incidental repairs. From the attempts made by the railways to pool the engines on account of the lack of engines during the war and at the time of the application of the eight-hour day, together with the observations made on the results obtained in the transport service by the American forces in France during the war, we have been able to draw the conclusion that, even in the case of two-cylinder single expansion engines the number of locomotives required for the assigned service, only slightly exceeds—less than 10 per cent—that required in the pooled service. With the more complicated compound engines, the maintenance of which requires more attention, the difference would be still less and, perhaps, even to the advantage of the assigned system.

As this latter system is much superior as regards fuel consumption and cost of maintenance, the French railways continue to use it even though the eight-hour day has increased the number of engine terminals and the number of engines themselves.

Conclusions

The efforts which the railways made to reduce fuel consumption had produced very considerable results before the war. In both passenger and freight service the fuel consumption per gross ton-mile hauled, had diminished by more than 10 per cent between the years 1900 and 1913, in spite of an appreciable increase in speeds. In 1913 the average fuel consumption was about 65 kilograms of coal per 1,000 ton-kilometers (209 lb. per 1,000 ton-mile) hauled and 18 to 19 kilograms per train-kilometers (64 lb. to 67.5 lb. per train-mile). In some services, where the engines had been replaced by more modern ones, the saving reached 40 per cent.

Unfortunately, the disorganization occasioned by the war has caused the greater part of the progress made to be lost. The railways are trying to remedy the causes of this increase, but it is certain that a considerable time will be required to get back to 1913 conditions.

On the other hand, experiments have been made for replacing coal with liquid fuel and also by the development of electric traction. Several engines have been equipped to burn oil, using the oil burning arrangements adopted in the United States. Up till now the results appear satisfactory from an operating point of view, but France does not possess any oil and has to import it. The problems of the cost of this fuel and certainty of supplies are still far from being solved.

On the other hand, the development of electric traction with hydro-electric power stations—there is abundant water power available in France—is certain. The three railways which are in mountainous districts, the Paris-Lyon-Mediterranean, the Paris-Orleans, and the Midi, have drawn up programs including, from now onward, the electrification of a large portion of their lines. Surveys are being made, a large part of the concessions granted, and the work will commence shortly. Nevertheless, it will still be some years, especially with the present delays in construction, before an appreciable saving in coal is reached. It will be possible to make a saving of 3,000,000 tons of coal per year when the whole program is completed.

Even for parts where steam-driven electrical power stations have to be used, the substitution of electrical power for steam locomotives ought to bring about a saving in coal of about 50 per cent.

A report of the proceedings of the later sessions of the convention will appear in a later issue.

The Pennsylvania and Its Employees

General W. W. Atterbury, vice-president of the Pennsylvania Railroad, has announced to employees that plans are being made for conferences with representatives of employees as recommended by the Railroad Labor Board in its decision under which all national agreements are to be terminated on July 1, next. General Atterbury says:

"The aim of the Pennsylvania Railroad during the last year has been to re-establish with its own men a happy and harmonious relationship. The request of the United States Railroad Labor Board is in line with precisely what the management of the Pennsylvania has desired. The employees have the right to select their representatives from among their own number. Detailed conditions designed solely to secure an accurate expression (by secret ballot) of the desire of the employees, under which representatives will be chosen, will be announced later. The men thus selected will be recognized by the management as empowered to speak for the men by whom they are chosen. The representatives chosen by the employees may or may not be union men, as the employees themselves decide.

"As soon as the representatives are elected, the officers will seek a conference with them, in order to negotiate rules and regulations. The representatives so chosen will be protected in their position no matter what may be their attitude with reference to the provisions of such rules and regulations. They will be provided with the necessary transportation, and the company will reimburse them for time lost and for reasonable expenses while on this service.

"While the immediate emergency to be covered is the preparation of mutually satisfactory rules and regulations, it is the hope of the management that the men thus chosen as representatives may serve as the nucleus of committees which shall frequently confer with the officers on all matters, not only affecting your welfare, but also the welfare of the railroad and of the public that we all serve.

"Together we will develop a plan under which every individual employee may have a voice in the progressive efforts of the railroad itself.

"There are three 'musts' that we shall have to work out in co-operation:

"First. The public must have efficient and economical service.

"Second. The officers and the employees must be paid good wages in return for good service rendered.

"Third. We must earn a reasonable return on the capital invested in the property.

"Through the representatives of the employees to be selected in the manner mentioned we shall be able to get closer together; we shall be able to look one another in the face and mutually to understand the facts affecting our common interest. The highest interests of the Pennsylvania Railroad can only be realized in the welfare of its employees."

George R. Loyall

GEORGE R. LOYALL, who has been selected, as already noted in these pages, to succeed J. H. Young as president of the Norfolk Southern when the latter leaves to take up his new duties as president of the Denver & Rio Grande Western, is an operating man of thorough training and experience. Mr. Loyall started his railroad career as an operator and station agent on the Chesapeake & Ohio. He later served in the employ of the East Tennessee, Virginia & Georgia, which subsequently became a part of the Southern Railway and then with the Southern itself. Employed first by the Southern as a superintendent, he then was promoted to assistant general superintendent, to general superintendent and to assistant vice-president (operation) with headquarters at Washington. Mr. Loyall, in other words, has a well grounded knowledge of railroad operations in the south to assist him in his new work with the Norfolk Southern.

The Norfolk Southern is not a large road. Its total mileage is 902 miles, exclusive of 42 miles of electric lines in the vicinity of Norfolk, Va. This mileage is all in Virginia and North Carolina, the lines of the railway extending from Norfolk, southwest and west to Charlotte, N. C., with various branches. The road was built primarily to reach extensive timber areas, but in more recent years its lumber business, while it has not decreased greatly in actual volume, has decreased greatly relatively to the total traffic. In 1910, for instance, the traffic in products of forests amounted to 816,252 tons, making up 55 per cent of the total tonnage. In 1920 the tonnage of products of forests was 698,572; but the percentage of the total tonnage handled was but 24.91. As the timber has been cleared, the land has been turned over to agriculture; products of agriculture in 1910 totaled 197,725 tons or 13 per cent of the total tonnage; in 1920, 393,456 tons or 14.04 per cent of the total tonnage. Another feature of the road's development has been the great expansion in traffic in products of mines and in manufactures. In 1910, products of mines made up 139,078 tons or 9.38 per cent; in 1920, 724,993 or 25.86 per cent. Manufactures in 1910 made up 248,047 tons or 16.72 per cent in 1910; in 1920, 723,193 or 25.79 per cent. The Norfolk Southern owns all the stock of the John L. Roper Lumber Company, which owns in fee some 600,000 acres of timber land. This land as it is being cut is being turned over to agriculture and has been found to be exceedingly fertile and productive.

The Norfolk Southern up to a few years ago extended only to Raleigh, N. C.; its extension to Charlotte is of comparatively recent date. When this extension was built it served more or less as a feeder to the rest of the system. In fact, it is worthy of note that until recently something like 95 per cent of the road's traffic was originated or delivered on the line or on connecting short lines. In August, 1920, however, this arrangement of things was changed by means of a traffic arrangement with the Southern Railway whereby through rates and divisions were established through Charlotte between points in the North and East and points to the south, southwest and southeast of Charlotte. This will give the Norfolk Southern a through traffic which it did not previously have and should have considerable effect on its earning power. To improve the line between Raleigh and Charlotte to meet the new conditions, a loan of $200,000 has been secured from the revolving fund. The total cost of the improvements contemplated is estimated at $400,000; they will give the road a considerably better grade and a much improved alinement.

These brief remarks about the Norfolk Southern will indicate the interesting problems which will confront Mr. Loyall when he takes up his new duties.

George R. Loyall was born in Albemarle County, Va., and was educated in the common schools. He began railway work with the Chesapeake & Ohio and served at various places as telegraph operator and station agent. He then went to the East Tennessee, Virginia & Georgia at Knoxville, Tenn., serving consecutively as car record clerk, operator, train dispatcher, chief dispatcher and master of trains. He subsequently entered the service of the Southern Railway and served consecutively on that road as superintendent of the Louisville division, also of the Asheville division and of the Knoxville division, then as assistant general superintendent of the Middle district at Knoxville, Tenn. Mr. Loyall was then appointed general superintendent of the Eastern district with headquarters at Charlotte, N. C., and later became general superintendent of the Middle district with headquarters at Knoxville, Tenn. He leaves the position of assistant vice-president in charge of operation of the Southern Railway System with headquarters at Washington, D. C., to take up his new duties as president of the Norfolk Southern. Mr. Loyall will have his headquarters at Norfolk, Va., in his new position.

G. R. Loyall

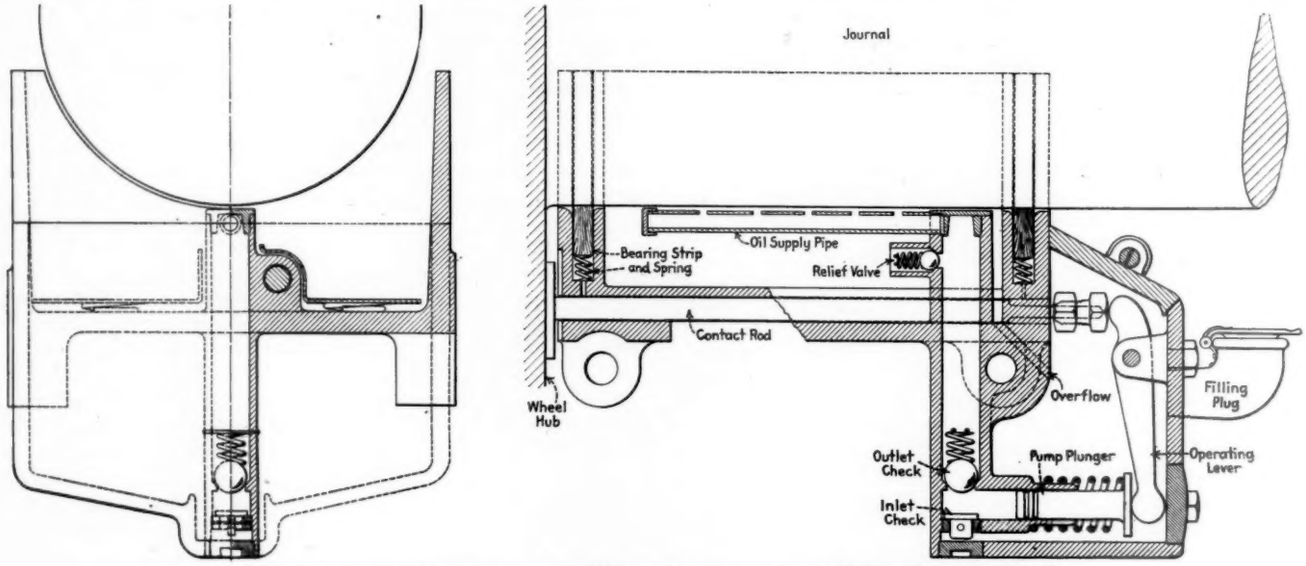
NORTHERN PACIFIC CASUALTY RECORDS.—Substantial progress in safety work has been made by the Northern Pacific during the last five years as is shown by the fact that fatal accidents to both employees and non-employees have been reduced 75 per cent and casualties to employees 60 per cent. In 1916, this road had 151 fatalities, while in 1920 there were but 52. Considering only employees in service, the record of 1916 shows one injured per month per 100 employees, while in 1920 this was reduced substantially one-half (to 0.51 per month); and in the four months ending with March this year the percentage was further reduced to 0.40. F. M. Metcalfe, assistant to the general manager, says that these casualty reductions mean a large money saving for the company, its total charges to personal injury accounts actually decreasing during the war and post-war periods, as compared with pre-war times. This, he says, is remarkable in view of the increase of 70 to 100 per cent in cost of settlement.

Automatic Journal Lubrication

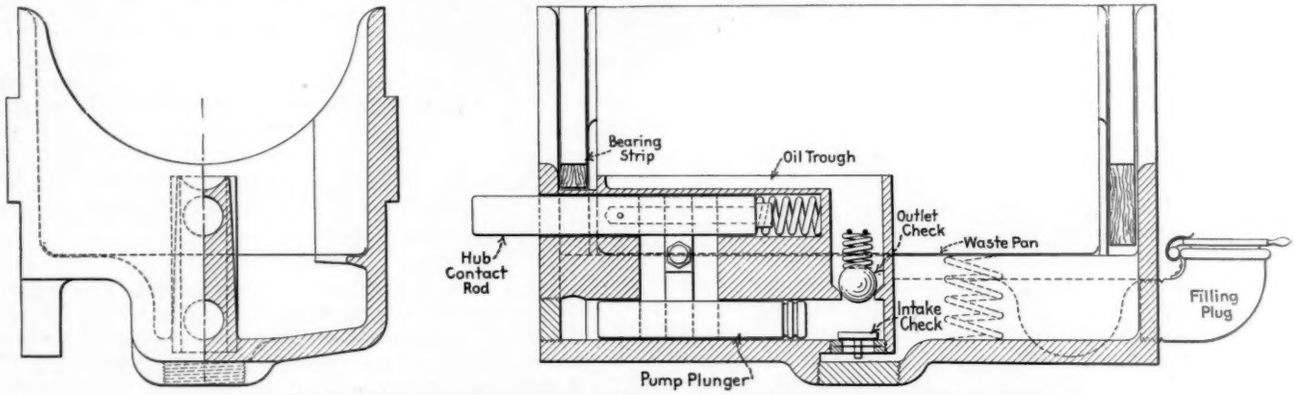
OWING TO INCREASED JOURNAL LOADS, speed requirements and extreme temperature variations in some parts of the country, present methods of lubricating the journals of railway equipment sometimes prove more or less inadequate. It is generally conceded that they have not kept pace with other improvements in equipment design. The amount of oil fed to high duty journals by capillary attraction through waste is insufficient and the direct results are costly hot boxes, delays and repairs to equipment. Contrary to the usual experience with car journals, locomotive driving journals lubricated with hard grease seldom become hot (at least hot enough to cut or score). This is because main bearings receive the personal attention of enginemen, and hard grease lubricates at a high temperature. The trouble is that hard grease does not begin to lubricate effectively until the journals become warm, and there is excessive friction.

The result of lubricating journal bearings with too light oil or too heavy grease is unnecessary friction, power loss, rapid wear of journals and bearings and consequent deterioration of other moving parts. Important economies in labor, material and reduced equipment delays would immediately result from delivering oil of a proper consistency (from a lubrication standpoint and not from a standpoint of its ability to feed through waste) to the journals. This oil should be delivered at all times and in a predetermined quantity regardless of atmospheric conditions by positive, reliable, mechanical means.

Lubricators designed to accomplish the above results have been developed by the Hennessy Lubricator Company, New York, being made in four styles for use with locomotive trailer, driver and truck wheels; also car wheels. Advantages claimed for these lubricators are that they are cheap, fool proof, have few parts and are easily applied, displacing the regular cellars without change or addition to bearings, journals or boxes. The lubricators are packed with waste in the regular manner and can be applied in roundhouses by regular forces. Pumping action is obtained from lateral wheel movement which is positive and regular. The waste is kept in contact with the journals by means of loose plates and springs and oil, being pumped up through to the journals, prevents the waste from glazing. The waste, in addition to distributing oil over the faces of the journals, is also a safety feature in the event of the pump becoming inoperative for any reason. Being always saturated with oil, the waste will continue to lubricate the journals, heating gradually and finally smoking, if a hot box develops.



Lubricator Arrangement as Applied to the Journals of Main Driving Wheels



Cross Section Showing Operation of Hennessy Engine Truck Journal Lubricator

Tests of Hennessy lubricators on lead trucks have demonstrated that about five times the ordinary mileage is made with a given quantity of oil. While it is recommended that the lubricators be removed for inspection at intervals of about 90 days, some have been in service on the Norfolk & Western as long as 11 months without being taken down for any purpose. The only attention required is the filling or supplying of oil to the cellars about once a week, dependent upon the class of service. It is stated that oil of the consistency of vaseline can be pumped through the lubricator if necessary.

General News Department

The De Queen & Eastern has completed the construction of its extension from De Queen, Ark., to Broken Bow, Okla., and has commenced the operation of this line.

The Order of Railroad Telegraphers, in convention at Savannah, Ga., on May 20, re-elected E. J. Manion, president. L. J. Ross was chosen secretary; headquarters, St. Louis, Mo.

The Interstate Commerce Commission has announced that oral arguments will be heard at Washington on June 20 in the case involving locomotives sent by the Pennsylvania to outside shops for repairs.

Senator Watson, of Indiana, has introduced in Congress a bill to amend Section 10 of the Clayton act, by defining the term "substantial interest" as used therein as meaning a financial interest of one per cent or more.

The City of Philadelphia has adopted "summer time," to go into effect on June 6; and the railroads are preparing new time-tables so as to run suburban trains, and some others, one hour earlier than by the present time-tables.

The Association of Railway Claim Agents held its annual convention at St. Louis, Mo., May 18, 19 and 20. James B. Green, claim agent of the Chicago & Junction, Chicago, was elected president. R. H. Doolittle (C. & S.), S. J. Peterson (U. P.), and W. H. Failing (C. N. J.), were elected vice-presidents, and H. D. Morris (N. P.), St. Paul, Minn., secretary-treasurer.

The Dallas Traffic Club, which has been inactive since the war, has been reorganized and the following officers elected: President, A. L. Reed, traffic manager, Sanger Brothers; secretary-treasurer, H. C. Eargle; first vice-president, Paul Junkin; second vice-president, Ferd Hicks; third vice-president, Julian Nance; board of governors, J. B. Jones, Elbert Blair, G. S. Maxwell, P. A. Richardson, E. C. Newlien and Don Allen. The officers will hold office until the regular election in November.

The bill reported at the last session of Congress by the Senate committee on interstate commerce as a substitute for Section 10 of the Clayton Anti-trust law was reintroduced in the Senate on May 24 by Senator Cummins as S. 1876. The bill represents a modification of the bill originally introduced by Senator Frelinghuysen at the request of the Association of Railway Executives in accordance with a number of suggestions made to the Senate committee by the Interstate Commerce Commission.

A. J. County, vice-president of the Pennsylvania Railroad, in an address before the Pennsylvania Bankers' Association at Atlantic City, N. J., on May 25, declared prompt and fair settlement for the Federal control and guaranty periods to be the essential need of the railroads to enable them to weather the deflation period successfully. "Beyond clearing away the differences that prevent prompt settlements, I feel that under existing conditions suggestions looking to a new national railroad policy and a vast increase of the regulatory commissions or bureaus should be held in abeyance until the Transportation Act has had a fair trial under something approaching normal conditions. Railroad managements, railroad employees and railroad investors should stand united. . . ."

American Association of Freight Traffic Officers

The American Association of Freight Traffic Officers held, at Chicago, on May 11, its first meeting since 1917, the war and federal control of the railroads having interrupted the activities of the organization. The following officers were elected: President, Fred Zimmerman (C. I. & L.), Chicago; first vice-president, C. E. Airey (C. of Ga.), Savannah, Ga.; second vice-president, R. C. Wright (Penn.), Philadelphia, Pa.; third vice-president, W. T. Stevenson (C. C. C. & St. L.), Cincinnati, Ohio; fourth vice-president, S. D. Houghton (A. T. & S. F.), Chicago; secretary-treasurer, Grant Williams, district freight agent, Chicago, Milwaukee & St. Paul, Chicago; executive committee, Paul Wadsworth, R. Van Ummerson, Archibald Fries, C. H. Stinson, Eugene Morris, W. M. Rhett, Charles Barham, L. E. Chalenor, W. A. Rambach and B. H. Stanage. The association now has 589 members.

The Labor Board's Pending Decision

The Railroad Labor Board, since its announcement of a "readjustment downward of wages" as reported in last week's *Railway Age*, has been in practically continuous executive session to determine the extent of the proposed reduction which it will announce on June 1. The necessity for these extended executive sessions is in part due to the fact that three members of the Board were seated after the wage case had been in progress for several days and partly because of the mass of evidence submitted by both the carriers and the employees.

Annual Election of New York Section of the A.S.C.E.

At the annual meeting of the New York Section of the American Society of Civil Engineers held on May 18th, 1921, the following officers were elected to serve for one year: President, Nelson P. Lewis, chief engineer, board of estimate and apportionment, New York City; secretary, J. P. J. Williams, New York; directors, Charles Gilman, C. F. Massey Company, New York and J. J. Yates, engineer of bridges, Central of New Jersey, Jersey City, N. J. The election of officers was followed by an address by Nelson P. Lewis on the New York Metropolitan District.

No Progress in Formation of Regional Boards

In none of the four regions of the country—Eastern, Southeastern, Northwestern or Southwestern—has agreement been reached between the representatives of the train and engine service brotherhoods and the managements of the various carriers for the establishment of regional boards of adjustment for the settlement of labor disputes. Negotiations with this end in view were started sometime ago at the request of the brotherhoods. It is understood that in two districts the proposal has been definitely vetoed by representatives of the railroads. In one district the employees failed to agree to the companies' proposal that the public should be represented on the board. In the Southeastern district, a conference on the proposal has been called for May 30.

Decline in Most Living Costs—Rents Rise

The Bureau of Labor Statistics' index number of wholesale prices of all commodities for April is 154. In March this figure was 162, and in April, 1920, it was 265. The total increase in living costs from the beginning of the war to March, 1921, was 68.7 per cent, according to data compiled by the National Industrial Conference Board. The rise in the cost of the major items from July, 1914, to March, 1921, is estimated as follows:

Food	56%	Fuel and light	87%
Shelter	71%	Sundries	85%
Clothing	74%		

The report shows that the peak of the living cost was reached in July, 1920. Since then total living cost has declined 17.5 per cent. This decrease is in food and clothing. Rents have, however, increased eight per cent, and fuel and light 13 per cent since that date. In some important cities rents have increased upwards of 100 per cent since 1914.

Pennsylvania Scheduled Freights Make Good Record

The through freight trains of the Pennsylvania Railroad which are run on schedules as recently announced, arrived at destination on time, in April, in 79 per cent of the trips. This is the first month for which complete figures of performance are available and the record is the best ever established by this road for regularity. It includes both east and west bound freight between Chicago and St. Louis on the west, and New York, Philadelphia, Baltimore, etc., in the east. During the month 1,396 freight trains were run on these schedules and 1,104 arrived at destination on time. But those that were late made connections in every case, so that all the freight was delivered to consignees on time. All perishable freight and live-stock, with some high class non-perishable merchandise is handled in this through freight service.

Hearings on Outside Repairs

The Interstate Commerce Commission's hearings on repairs to locomotives by contract in outside shops in 1920 were re-opened May 23 at New York by Examiner Barclay of the Interstate Commerce Commission. F. H. Hardin, Chief Engineer of Motive Power and Rolling Stock of the New York Central, was the principal witness. Mr. Hardin testified that the motive power of the company was in lamentable condition at the end of Federal control and that assistance in repairing some locomotives was absolutely necessary in order for the road to be able to handle the greatly increased traffic which was required of it. He pointed out also that the cost of classified repairs in the company's own shops showed a relatively low figure because various items of overhead expenses were not included in it.

R. B. Gregg, of the Railway Employees Department of the American Federation of Labor, cross-examined Mr. Hardin. Mr. Gregg said "Our view of the situation is that all railroads have followed the uniform policy of sending railroad equipment to outside shops for repairing for several reasons. The first and most important was an attempt to discredit and disrupt, if possible, the labor organizations of the roads. . . ." The hearings are being held in the rooms of the Merchants Association, 235 Broadway.

Revenues and Expenses for March

The Interstate Commerce Commission's monthly report of railway revenues and expenses for March and three months, covering 201 class I roads is as follows:

Item.	March 1921	March 1920	Three Months 1921	Three Months 1920
1 Average number of miles operated	235,581.76	234,599.99	235,575.51	234,444.81
Revenues:				
2 Freight	$320,694,043	$324,598,960	$929,644,096	$935,377,083
3 Passenger	97,312,305	92,631,705	291,107,003	267,076,918
4 Mail	9,673,927	8,390,790	25,814,961	77,978,159
5 Express	6,980,555	11,729,993	18,883,198	37,300.721
6 All other transportation	13,038,363	11,942,232	38,203,468	33,630,569
7 Incidental	11,173,604	10,671,666	30,326,954	33,066,127
8 Joint facility—Cr.	659,099	401,084	1,972,908	1,783,604
9 Joint facility—Dr.	269,386	178,993	593,202	595,214
10 Railway operating revenues	459,262,510	460,187,437	1,335,359,386	1,385,617,967
Expenses:				
11 Maintenance of way and structures	62,029,061	67,464,136	176,510,015	189,760,588
12 Main. of equipment	107,416,514	117,268,106	340,154,840	353,815,196
13 Traffic	7,346,699	5,076,460	21,729,507	15,028,218
14 Transportation	205,048,309	213,651,070	634,387,887	644,223,484
15 Misc. operations	4,171,621	4,536,761	12,680,982	13,265,193
16 General	14,910,557	12,643,971	44,256,331	38,030,428
17 Transportation for investment—Cr.	493,453	190,063	1,447,765	882,565
18 Railway operating expenses	400,429,308	420,450,441	1,228,271,797	1,253,240,542
19 Net revenue from railway operations	58,833,202	39,736,996	107,087,589	132,377,425
20 Railway tax accruals	22,641,366	21,203,542	68,098,464	61,960,924
21 Uncollectible railway revenues	85,111	79,995	234,375	298,686
22 Railway operating income	36,106,725	18,453,459	38,754,750	70,117,815
23 Equipment rents—Dr. balance	3,993,676	2,329,249	10,740,443	7,357,273
24 Joint facility rent—Dr. balance	1,417,857	1,351,304	4,542,032	4,748,691
25 Net of items 22, 23, and 24	30,695,192	14,772,906	23,472,275	58,011,851
26 Ratio of expenses to revenues (per cent)	87.19	91.37	91.98	90.45

Traffic News

The Denver Commercial Traffic Club has elected James P. Gibson, president, and Charles J. Hotchkiss, secretary-treasurer.

The Atchison, Topeka & Santa Fe will run 16 special trains, leaving Chicago and Kansas City, July 3 and 4, for the Elks' convention at Los Angeles, Cal.

Shipments of perishables from California have been greater this year than last, according to figures given out on May 13, by C. M. Secrist, vice-president of the Pacific Fruit Express Company. Fruit and vegetable shipments in 1920, for this period, originating in the territory west of Ogden, Salt Lake, and El Paso, and south of Ashland, Ore., numbered 22,574 cars, while this year the total is 24,777 cars.

The National Industrial Traffic League, at its meeting in Cleveland, Ohio, on May 25, adopted a resolution advising members to proceed in an orderly manner, as provided by the Act to Regulate Commerce, to obtain proper redress of their individual grievances: "the National Industrial Traffic League deprecates any effort toward a general downward revision of rates until the carriers have had an opportunity to adjust their expenses so as to insure proper transportation service and facilities and a reasonable return on their property under economical and efficient management." Traffic executives of the carriers, and shippers, through their respective organizations, are urged to meet in conference and endeavor to reach agreements on all questions in controversy, thus avoiding wherever possible litigation before the commission.

A conference between the traffic vice-presidents of the Eastern railroads and representatives of shippers of road-building materials for the purpose of discussing possible reductions in the rates on these materials in order to stimulate their movement has been arranged for June 2. Representatives of the shippers had previously announced that such a conference was to be held with the railroad executives at Washington on May 13, but the announcement was premature. In a letter dated May 13 to E. Guy Sutton, of the Sand & Gravel Association, Daniel Willard, president of the Baltimore & Ohio, said that the matter of a conference between the railroad executives and shippers as proposed by the shippers has been given consideration at a meeting of the railroad executives and as a result it was decided to ask G. H. Ingalls, vice-president of the New York Central, and chairman of the executive committee of the eastern traffic vice-presidents, to get in touch with the shippers and arrange for a conference for the purpose of discussing any inequalities that may have resulted from or have been emphasized by the commission's decision in Ex Parte 74. Mr. Willard said that he understood it was expected that the discussion would be confined to materials entering into the roadbuilding program, but that he was certain that the committee or the traffic official of any railroad would be willing to take up at any time any inequalities of the rate structure such as he had referred to.

Traffic Statistics for February

According to the Interstate Commerce Commission's monthly bulletin of revenue traffic statistics covering 173 steam roads, the number of ton miles of revenue freight moved during February was 22,544,000,000, as compared with 30,291,000,000 in February, 1920. The average haul shows an increase as compared with 1920, and the average revenue per ton mile shows an increase as compared with previous months, an average of 1.25 cents as compared with .985 in February, 1920. In January it was 1.21 cents. The number of revenue passengers carried was 83,474,000 as compared with 91,673,000. The average revenue per passenger mile was 3.08 cents as compared with 2.59. The number of revenue passengers per car was only 16.56 as compared with 18.49 in February, 1920.

Commission and Court News

Interstate Commerce Commission

The commission has suspended from May 27 until September 24, the operation of schedules which provide increased minimum weights and increased class and commodity rates between points in Oregon, Washington and British Columbia to the level of the rates in the same general territory not affected by water competition.

Liability for Telegraph Negligence Increased

The Interstate Commerce Commission in decision No. 11,524, reviewing also case No. 8,917, has decided that the rules of the telegraph companies limiting liability for negligence in the transmission or delivery, or for non-delivery, of interstate messages, repeated and unrepeated, are unreasonable; and has ordered that, beginning July 13 next, the universal rule must limit the liability of the company in the case of unrepeated messages to not less than $500, and in the case of repeated messages to not less than $5,000; and on messages on which the sender puts a value, in writing, the rate is to be one-tenth of one per cent of the amount by which such valuation shall exceed $5,000.

The principal ground on which this extension of liability was ordered seems to be that the Western Union has for many years followed the liberal policy of allowing general superintendents to pay reasonable claims, up to $500, without submitting them to the legal department and without reference to the contract printed on the telegram blank, to which, among other provisions, stipulates a limit of $50. The Postal Company opposed any increase of liability on the ground that it could not stand the additional expense; but no figures were given to sustain this argument.

Commissioner Potter dissented, holding that senders of telegrams desiring insurance should pay for it and that under the rule now prescribed, the company, in paying perhaps excessive damages, would be putting a burden on all other senders of telegrams. Existing arrangements, said Mr. Potter, will amply secure those who are willing to pay for their insurance.

The majority opinion holds that the practice of the Western Union is contrary to the spirit and terms of the Interstate Commerce Act; paying a sum larger than the stipulated liability is the same as making an unlawful rebate. The Western Union also objected to having its practice written into the terms of the law, fearing impairment of revenue; but the Commission finds that notwithstanding the company's liberal practice in the past, its surplus increased from $7,733,693 on June 30, 1910, to $32,518,994 on December 31, 1918; that dividends in 1917 and 1918 were at the rate of seven per cent and that in eight years the company's funded debt had been reduced from forty millions to thirty-two millions.

The report in this case brings out interesting details. The Commission seems to think that fewer mistakes in transmission ought to be made now than fifty years ago, when the limitation of liability was first imposed, because of the improvement in machinery. At the present time one-half of all the messages transmitted by the Western Union, particularly between large cities, are sent by automatic apparatus. The records of the Postal Company show that messages erroneously transmitted number only one in 25,000 or 30,000. Repetition of messages is seldom ordered, one operator testifying that in 18 years he had not transmitted more than about 200 such messages. Dealers in perishable commodities say that they cannot afford the delay incident to repetition of messages. The record in this case shows only one instance where a repeated message failed to accomplish its purpose; that was a case where delivery was delayed. The valued message appears to be of no practical use in the great majority of instances; as neither the sender nor the company can make any reasonable estimate of the probable loss in case of default on the part of the telegraph company.

Foreign Railway News

Swiss Federal Railways Losing Money

The operating revenues of the Swiss State Railways for the first three months of 1921 were $16,287,600 and the operating expenses $17,169,600, according to information from Consul Thornwell Haynes at Berne. For the similar period of 1920, operating revenues were $17,354,400 and operating expenses $15,815,000.

Seek Agreement in Argentine Railway Dispute

According to a correspondent of the Evening Post (New York), conferences are now being held in Buenos Aires between the British railways, the government and representative shippers in the attempt to arrive at an amicable settlement of the disputes which have arisen over the sharp rate advances put into effect in March. These increases have been declared illegal by the government and the companies have been fined heavily. The shippers are contending, the correspondent says, that the new rates will put them at a disadvantage in competition with American, Russian and Australian producers in the European cereal markets. It is believed that the government is disposed to look favorably upon some rate increases in view of recent wage increases, but has adopted a stern policy toward the railways in order to secure the presentation of evidence on both sides of the controversy.

The earnings of these roads for the fiscal year 1920, which were reported in the *Railway Age* of May 20 (page 1190), were comparatively high, but from July 1, 1920, to April 1, 1921, it is said that the Central Argentine is the only road which shows any gain over the figures for the preceding year. The other lines show declines in revenue from seven to 22 per cent.

American Becomes Mechanical Officer of a Manchurian Railway

Frank S. Robbins, formerly master mechanic of the Pennsylvania at Pittsburgh, has been appointed mechanical advisor to the Chinese Eastern Railway, which is a part of the Trans-Siberian System. He will serve under the direction of J. F. Stevens, president of the Inter-Allied Technical Board of the Orient. Mr. Robbins was born at Menantico, N. J., December 22, 1880, and was educated at Purdue University. Upon graduation in mechanical engineering he entered railroad work as a machinist's apprentice with the Union Railroad in New Jersey. He later entered the Altoona shops of the Pennsylvania Railroad as special apprentice and upon completion of this course was appointed motive power inspector at the West Erie shops. In 1909 he was appointed assistant master mechanic of the Monongahela division and, in 1911, assistant road foreman of engines, Renova, Pa. In 1912 he was appointed assistant general foreman of the Pitcairn car shops, Pitcairn, Pa., and in 1913 was promoted to master mechanic of the Pittsburgh division.

In 1917, Mr. Robbins entered military service and was commissioned a captain in the Railway Engineers, being assigned to command Company D of the 19th Engineers (Railway). While a member of the American Expeditionary Forces in France his railroad experience was of considerable assistance in constructing railway shops at Bassens and organizing the personnel for their operation. He was appointed superintendent of motive power of "D" line and as a result of his work was promoted to the rank of major of engineers. In 1919, Major Robbins was discharged from military service and was appointed assistant engineer, maintenance of equipment, in the office of the assistant to the president of the Pennsylvania at Philadelphia. In December, 1919, he was appointed master mechanic of the Pittsburgh division which position he held until the reorganization of the Pennsylvania. Upon the return of the roads to their owners, Mr. Robbins was appointed master mechanic of the new Pittsburgh Terminal division. On March 15, 1921, he resigned his position with the railroad company to serve with the Inter-Allied Technical Board. Mr. Robbins' headquarters in his new position will be at Harbin, Manchuria.

Equipment and Supplies

Car Building in 1919 and 1914

A preliminary statement of the general results of the 1919 census of manufactures with reference to the construction of steam and electric railroad cars has been issued by the Bureau of the Census, Department of Commerce.

Returns were received in 1919 from 121 establishments which manufactured 162,511 steam and electric railroad cars, valued at $403,517,000, these figures including such cars as were built in railroad repair shops, and as subsidiary products by establishments engaged primarily in other lines of manufacture.

Of the total number of cars built in 1919, 160,159 were for use on steam railroads, and 2,352 on electric roads. Only 294 steam passenger cars were constructed during the year as compared with 3,568 in 1914, while, on the other hand, freight and other types of steam railroad cars increased from 131,292, in 1914, to 159,865 in 1919.

The statistics for 1919 and 1914 are summarized in the following table. These figures are preliminary and subject to such change and correction as may be necessary from further examination of the original reports:

	1919	1914
Total Cars Built—		
Number	162,511	137,823
Value	$403,517,000	$164,960,000
Steam Railroad Cars—		
Number	160,159	134,960
Value	$389,078,000	$154,797,000
Passenger—		
Number	294	3,568
Value	$5,602,000	$45,245,000
Freight and Other—		
Number	159,865	131,392
Value	$383,476,000	$109,552,000
Electric Railroad Cars—		
Number	2,352	2,863
Value	$14,439,000	$10,163,000

Locomotives

THE MISSISSIPPI CENTRAL has ordered 3 Mikado locomotives from the American Locomotive Company.

THE CALIFORNIA WESTERN RAILROAD & NAVIGATION COMPANY has ordered one Pacific locomotive from the Baldwin Locomotive Works.

THE CIA MEXICANA DE COMBUSTIBLES, Mexico City, Mexico, has ordered 4 consolidation type locomotives from the Baldwin Locomotive Works.

THE PARKLAP CONSTRUCTION CORPORATION, 84 Pine street, New York, has ordered 1, 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 14 by 22 in. cylinders and a total weight in working order of 79,000 lbs.

Freight Cars

THE SIERRA OF CALIFORNIA has renewed its inquiry for 30 to 40 ballast cars.

THE PHILADELPHIA & READING is contemplating having repairs made on 500 to 1,000 box cars.

The BUFFALO CREEK & GAULEY has ordered 10 20-ton flat cars from the Koppel Industrial Car & Equipment Co.

The ALABAMA, TENNESSEE & NORTHERN is inquiring for 150 gondola cars and 100 box cars, U. S. R. A. standard.

Passenger Cars

MITSUI & Co., New York, are inquiring for 150 electric motor trucks, for use on the Tokyo Municipal Railways.

Machinery and Tools

The HARTFORD & SPRINGFIELD STREET RAILWAY COMPANY has ordered a 200-ton car wheel press from the Niles-Bement-Pond Company.

The CHICAGO, ROCK ISLAND & PACIFIC has ordered 1 36-in. lathe and 1 90-in. quartering machine from the Niles-Bement-Pond Co.

The VIRGINIAN RAILWAY has ordered 4 Ryerson-Conradson engine lathes and a 5-ft. Ryerson-Conradson radial drill, from Joseph T. Ryerson & Son; 1 boring mill from the Bullard Machine Tool Company and a driving wheel lathe from William Sellers & Co., Inc.

Miscellaneous

MITSUI & Co., New York, have ordered from the Union Switch & Signal Company four sets of color light signals, for use on the Japanese Government Railways.

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon June 8, for its requirements until July 1, 1921, of steel wheels for passenger car and locomotive repairs, in accordance with standard blue prints and New York Central specifications 372-C.

Signaling

THE ERIE RAILROAD has ordered from the General Railway Signal Company an electric interlocking machine, 11 working levers, with four switch machines and three signals, for a drawbridge at Newark, N. J.

Railway Construction

CHICAGO, ROCK ISLAND & PACIFIC.—This company is accepting bids for the construction of a new roundhouse at Amarillo, Tex.

CHICAGO, ROCK ISLAND & PACIFIC.—This company, which was noted in the *Railway Age* of May 6 (page 1093) as accepting bids for the construction of a coaling station at Morris, Ill., has awarded the contract for this work to Roberts & Schaefer, Chicago. The station will be a 500-ton, fireproof structure.

CHICAGO UNION STATION.—This company closed bids on May 26 for the completion of the filled portion of the Polk street viaduct, Chicago, and the construction of a viaduct on Van Buren street, between Canal street and the Chicago river.

DETROIT & IRONTON.—The Interstate Commerce Commission has issued a certificate authorizing the construction of a line in Wayne County, Mich., approximately 15 miles long, extending southward from Spring Wells or Fordson to a connection with the Detroit, Toledo & Ironton near Trenton or Flat Rock. The matter of the application for a certificate authorizing the acquisition by lease of the property of the Detroit, Toledo & Ironton has been assigned for argument before the commission in Washington on May 27.

ILLINOIS CENTRAL.—This company closed bids on May 23 for the construction of a subway near Earlville, Ia. The company is also accepting bids for an extension to its roundhouse at Paducah, Ky.

ILLINOIS CENTRAL.—This company which was noted in the *Railway Age* of May 20 (page 1192) as accepting bids for the construction of additions to its roundhouse at Freeport, Ill., has awarded a contract for this work to Joseph E. Nelson and Sons, Chicago.

THE PITTSBURGH & WEST VIRGINIA reported in the *Railway Age* of May 6, as asking for prices on repairs to 500, 70-ton coal cars, is now inquiring for 500 steel hopper car bodies.

THE SIERRA RAILWAY OF CALIFORNIA, is inquiring for 35 to 40 Roger ballast cars, of 40 and 50-tons capacity.

TEXAS MIDLAND.—This company has awarded a contract to Becknal Brothers, Terrel, Tex., for the construction of a line between Greenville and Commerce, Tex., at an estimated cost of $500,000.

Supply Trade News

The Galena-Signal Oil Company will remove its New York City office on June 1, from 17 Battery Place to the Liggett Building, 41 East Forty-second street.

E. D. Wilmer, vice-president of the Steel & Tube Company of America, at Milwaukee, Wis., has been elected president of the **Goodyear Tire & Rubber Company,** at Akron, Ohio, succeeding F. A. Seiberling.

Clement F. Street, formerly vice-president of the Locomotive Stoker Company, has opened an office in the Smith building, Greenwich, Conn., for the purpose of placing on the market the Street locomotive starter for application to locomotive trailer trucks and tenders.

Ralph S. Cooper, vice-president and general sales manager of the **Independent Pneumatic Tool Company,** Chicago, has been appointed general manager in addition to his other duties. Mr. Cooper has just returned from Europe where he has been for the past eight months establishing branch offices and agencies for the company.

Harry B. Stafford, for some time general agent for the Southern Railway at Minneapolis, has become associated with the **National Surety Company,** 115 Broadway, New York. Mr. Stafford left the Southern Railway to enter the Construction Division of the United States Army early in the war and attained the rank of major.

Harry W. Finnell has become connected with the sales department of the **Automatic Straight Air Brake Company,** with headquarters at the company's general offices, 210 Eleventh avenue, New York City. Mr. Finnell served with the Chicago Railway Equipment Company from 1906 to 1909 as railway sales manager and later became assistant to president of the Carbon Steel Company, Pittsburgh, Pa. In 1914, he was appointed general manager of the Henry Giessel Company, Chicago, and during 1915 and 1916, was vice-president of Templeton, Kenley & Co., Ltd., Chicago. He was manager of the War Industries Bureau for Illinois and was also affiliated with the War Industries Board during the war, since which time he has been in the export business. His appointment with the Automatic Straight Air Brake Company became effective on May 15.

Obituary

Lawrence F. Braine, a director of the Rail Joint Company, New York, died on May 24, at his home in New York City, at the age of 64. In 1896, he went with the Continuous Rail Joint Company of America, Newark, N. J., which company was combined later with the Weber rail joint and the Wolhaupter rail joint to form the present Rail Joint Company. From 1905 to 1916, Mr. Braine served as director and vice-president of the Rail Joint Company and then retired from active service, remaining as director of the same company until his death.

Trade Publications

WATER SOFTENERS.—The Graver Corporation, East Chicago, Ind., has issued two bulletins describing the company's large continuous water softener (type K) and the small continuous water softener (type KM). Each bulletin opens with a short discussion of water softening and the choice of suitable apparatus. This is followed by descriptions of the operation of the plants which are described in detail and illustrated in numerous photographs. Drawings are shown of typical foundations and upper and lower housings, and charts are given to illustrate the loss of water storage space by converting existing storage tanks into water softeners.

Railway Financial News

ALABAMA GREAT SOUTHERN.—*Dividends Reduced.*—This company has declared semi-annual dividends of 3 per cent on the common stock of record May 31, and 3 per cent on the preferred stock, payable August 18 to stock of record July 14. The last semi-annual dividends paid by the company were 3½ per cent on both issues.

BUFFALO, ROCHESTER & PITTSBURGH.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $3,949,000 of consolidated mortgage bonds and to pledge and repledge from time to time all or part of the bonds as collateral security for short term notes.

CHESAPEAKE & OHIO.—*Dividend Deferred.*—The directors on May 20 deferred action on the usual dividend of 2 per cent for the current half year. Disbursements at the rate of 4 per cent a year were made from 1917 to 1919 inclusive.

Annual Report.—The corporate income account for the year ended December 31, 1920, compares with the previous year as follows:

	1920	1919	Increase or Decrease
†Net Income, including compensation for January and February, 1920, and net operating income of company from March to December, 1920, inclusive	$14,878,831	$14,588,579	$290,252
*General expenses (corporate)	39,642	202,048	—162,407
Federal income tax accruals	580,000	319,999	260,002
	$14,259,189	$14,066,532	$192,657
Other Income	1,901,583	1,215,830	685,753
Gross Income	$16,160,772	$15,282,362	$878,410
Interest on Debt	$9,953,407	$8,773,843	$1,179,563
Total deductions	$10,174,314	$9,508,193	$666,121
Net Income	$5,986,458	$5,774,169	$212,290
Dividends, 4 per cent	$2,511,264	$2,511,264	
Balance to credit of profit and loss December 31, 1920			$15,341,106

†Includes $2,700,000 amount received from the Interstate Commerce Commission as an advance under the guaranty provided by Section 209 of Transportation Act, 1920.
*General expenses 1920 refer to months January and February only.

The annual report of the Chesapeake & Ohio will be reviewed editorially in an early issue.

CHICAGO JUNCTION.—*Hearings on Acquisition by New York Central Closed.*—See New York Central.

CHICAGO, ROCK ISLAND & PACIFIC.—*Asks Authority to Issue Bonds.*—This company and the Burlington, Cedar Rapids & Northern have jointly applied to the Interstate Commerce Commission for authority for the issuance of $1,905,000 of consolidated first mortgage 5 per cent bonds of the B., C. R. & N., to be used to retire another issue of bonds at maturity and to be sold to the Rock Island for cash. The Rock Island also asks authority to issue a similar amount of first and refunding mortgage gold bonds to be issued against the B., C. R. & N. bonds.

DELAWARE, LACKAWANNA & WESTERN.—*Annual Report.*—The corporate income account for the year ended December 31, 1920, compares with the previous year as follows:

	1920	1919	Increase or decrease
Net earnings coal department:			
Sales and rents	$51,193,938	$44,325,488	$6,868,450
Less expenses	44,662,844	39,344,273	5,318,571
	$6,531,094	$4,981,215	$1,549,879
Adjustment of value of coal on hand	27,152	8,467	—35,618
	$6,503,942	$4,989,682	$1,514,261
Earnings railroad department:			
Revenues	$70,478,816	.....	.....
Less operating expenses, taxes, etc.	65,218,581	.....	.....
	‡$5,260,235	.....	$5,260,235
Income from lease of road (2 months)	†3,249,379	*17,324,424	—14,075,045
Government advances on guaranty	5,124,500	.....	5,124,500
Miscellaneous rent income	304,024	328,300	—24,276
Dividend income	386,756	413,269	—26,514
Income from funded securities	680,250	362,848	317,402
Income from unfunded securities and accounts	786,985	554,891	232,094
Depletion of coal deposits	2,018,593	1,956,616	61,977
Hire of equipment—Cr. balance	653,858	.....	653,858
Total including other	$25,446,520	$25,453,407	—$6,887

Deductions from income:			
Rentals of leased bonds	$6,128,996	$6,126,908	$2,088
Additions and betterments	2,509,679	869,556	1,640,123
War revenue taxes	1,122,917	1,710,374	—587,457
Total including other	$13,675,109	$16,072,200	—$2,397,091
Dividends declared	8,444,110	8,444,455	—345
	$5,230,999	$7,627,745	—$2,396,746

*Certified compensation accrued year 1919, including $1,574,948, being 10 per cent of compensation for the year 1918 accrued in July, 1919, upon completion of the contract between the director general of railroads and the company.

†Includes adjustment of standard return for years 1918 and 1919 amounting to $616,936.

‡Covers railroad operations for the ten months ending December 31, 1920.

The annual report of the Delaware, Lackawanna & Western will be reviewed editorially in an early issue.

DENVER & RIO GRANDE.—*Another Protest from Stockholders.*—Arthur M. Wickwire, counsel for the stockholders' protective committee, has sent a letter to Hon. Edgar E. Clark, chairman of the Interstate Commerce Commission, in which he says, in part:

> The stockholders' protective committee now desires to present a further objection, namely, that the new company, to which it is proposed to transfer the Denver & Rio Grande properties, is not organized under the laws of either Colorado, Utah or New Mexico, where the railroad is located, but under the laws of the state of Delaware, located about 2,000 miles away.
>
> The charter of this new company—the Denver & Rio Grande Western Railroad Company—is a legal anomaly, and is what is known as a "tramp" corporation. It is not organized under the provisions of the Delaware laws governing railroads operating in Delaware; but is organized under the provisions applicable to ordinary business corporations with power to own and operate railroads only outside the state of Delaware.
>
> Railroads organized for operation within the state of Delaware are subject to many regulations, enacted for the protection of the stockholders, the bondholders, the adjacent landholders, and the public. Not one of these safeguards is contained in the statutory provisions applicable to the charter of this new company. It cannot operate a mile of railroad in the state of Delaware; but it is authorized to exercise railroad powers anywhere outside the state of Delaware. The legislation of Delaware has been very careful to protect its own citizens with respect to all railroads within the state, but it authorizes charters for foreign use under which roads may operate without any safeguards or restrictions whatever.

GRAND TRUNK.—*New Directors.*—The Canadian Government has nominated the following directors in accordance with the bill recently passed by the Dominion Parliament: Sir Joseph Flavelle, Howard G. Kelley, A. J. Mitchell, E. L. Newcombe, K. C., and J. N. Dupuis.

This board will be temporary, preparatory to the bringing into force of the Canadian National Railways Act, which provides for the unified management of all government railways.

HAWKINSVILLE & FLORIDA SOUTHERN.—*Asks Authority to Abandon Line.*—The receiver has applied to the Interstate Commerce Commission for certificate authorizing the abandonment of its line of 96.38 miles in Georgia, on the ground that it is impossible to operate it except at a loss and that it has been operated at a loss for the past seven years.

HOCKING VALLEY.—*Dividend Deferred.*—The directors on May 19 deferred action on the regular semi-annual dividend of 2 per cent which is usually paid in June.

President W. J. Harahan stated that the directors had simply decided to defer action until the trend of conditions had been more clearly demonstrated.

LOS ANGELES & SALT LAKE.—*Union Pacific Acquires Senator Clark's Holdings.*—See Union Pacific.

MICHIGAN CENTRAL.—*New Directors.*—Vice-President E. D. Bronner and Henry M. Campbell, of Detroit, have been elected directors. Samuel Mather has resigned from the board.

NEW ORLEANS, TEXAS & MEXICO.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $561,800 of first mortgage 6 per cent gold bonds to reimburse the treasury for expenditures for additions and betterments and to be used as collateral for a loan of $500,000.

NEW YORK CENTRAL.—*Hearings on Acquisition of Chicago Junction Closed.*—The hearings before Examiner W. H. Colston, of the Interstate Commerce Commission, at Chicago, on the application of the New York Central to take over the Chicago Junction, were brought to a close on May 19, upon telegraphic instructions from the Interstate Commerce Commission. This is in line with the recent policy of the commission to rush to a close important hearings after sufficient testimony has been heard in order that a prompt decision may be rendered.

On May 17, J. W. Roberts, general superintendent of transportation of the Northwestern region of the Fennsylvania, stated that a diversion of traffic from other trunk lines connecting with the neutral Junction property, as might be expected if the New York Central secured control, would greatly reduce the value of the facilities of other trunk lines, built to take care of the Junction traffic. Fifty-two per cent of the total Chicago business of the Pennsylvania System, according to Mr. Roberts, came out of the Chicago Junction district. To consent to the sale, he said, would deprive the trunk lines of some of their privileges, would hinder the flexibility of operation within the Chicago terminals and make more difficult the co-ordination of the terminals with other facilities. All of these conditions, he declared, would be against the public interest.

W. H. Scriven, superintendent of the Chicago terminal division of the Pennsylvania, stated that the Pennsylvania is not opposed to unified terminals, provided their interests in the public service are safeguarded, but it is opposed to the acquisition of a neutral switching road like the Chicago Junction, by one or two trunk lines.

O. F. Clarke, superintendent of transportation of the Grand Trunk at Chicago, testified that if the New York Central acquired the Junction road it could and probably would get all or most of the competitive business of the Junction and so deprive the Grand Trunk of about 60 per cent of its traffic out of Chicago.

On the closing day of the hearing Willis E. Gray, terminal expert, testified that the present New York Central terminal facilities offered ample opportunities for expansion and were more than adequate. He also said that the New York Central was negotiating for the purchase of the Chicago & Illinois Western, a 25-mile line, with 37 miles additional under construction, between Chicago and Joliet. He asserted that the acquisition of this outer Belt property by the New York Central would give it monopolistic control of the inner and outer belt lines of the Chicago Terminal.

Irving Herriott, attorney for the shippers who are objecting to the sale of the property, called several witnesses at the close of the hearing, who testified to the pressure that had been brought to bear upon upon them to make them withdraw their opposition.

PENNSYLVANIA.—*Asks Authority to Acquire Stock.*—This company has applied to the Interstate Commerce Commission for authority to purchase from the Pennsylvania company $34,000,000 of the guaranteed special stock of the Pittsburgh, Fort Wayne & Chicago and to assume the obligation and liability of the Pennsylvania company under its guaranteed trust certificates for which the stock was deposited as collateral security. The certificates are outstanding to the amount of $33,239,000, and the Pennsylvania is to pay the difference of $761,000 in cash.

PENNSYLVANIA RAILROAD.—*Loan from Revolving Fund Approved.*—The Interstate Commerce Commission has certified to the Treasury its approval of a loan of $5,700,000 to this company for 15 years for the purpose of assisting it in meeting maturing indebtedness to the amount of $5,857,900, of which the company itself is to provide $157,900.

READING.—*Dissolution Plan Approved.*—The United States District Court at Philadelphia, on May 21, approved the modified plan for segregating the Reading company's coal and railroad properties. The two important points decided by the court for modification from the original plan, noted in the *Railway Age* of February 18, 1921, page 425, were decided and will be embodied in a new decree to be submitted within fifteen days, or on June 6, by the Reading company to the government

The first point was the disposition of $8,000,000 of stock of the Reading Coal and Iron Company, which was owned by the Reading company. The court orders that this stock is to be divided proportionately between the two classes of Reading stock, the preferred sharing equally with the common. The second is regarding the sale of the stock of the New Jersey Central. The court orders that this stock be placed in the hands of a trustee until a favorable time arrives for its sale.

See editorial on another page of this issue entitled "Reading Plan Approved."

Alfred A. Cook, attorney for Henry Evans, representing the Continental Insurance Company and the Fidelity-Phenix Fire Insurance Company, will appeal to the Supreme Court against the decision. These insurance interests hold 8,400 shares of common stock in the Reading company. They object to that part of the plan which gives the same and equal rights to the preferred and common stockholders to subscribe for stock in the new coal company.

E. P. Maynard, president of the Brooklyn Trust Company, has been elected chairman to succeed Seward Prosser, president of the Bankers Trust Company, and chairman of the Reading common stockholders' committee. Frederic F. Gunnison, vice-president of the Lawyers' Title and Trust Company, has been

elected secretary to succeed B. W. Jones, also of the Bankers Trust Company.

It is understood that Mr. Prosser will remain as a member of the committee, which will be enlarged to include four other members. Mortimer N. Buckner, president of the New York Trust Company, and John H. Mason are also slated to remain on the committee.

The reorganized common stockholders' committee will co-operate with counsel for the Henry Evans group of insurance companies in carrying their fight to the United States Supreme Court.

ST. LOUIS-SAN FRANCISCO.—*Annual Report.*—The corporate income account for the year 1920 compares with 1919 as follows:

	1920		1919
Federal compensation (2 months of 1920)	$2,270,838		$13,415,510
Government guaranty (6 months)	*7,518,198		.....
Additional compensation	†419,034		.....
Net operating income (4 months)	5,536,517		.....
Total	$15,744,587		$13,415,510
Other income	597,498		524,251
Gross income	$16,342,085		$13,939,761
Interest, taxes, rentals, etc.	‡14,598,854		14,091,812
Surplus	$1,743,231	Def.	$152,051

*Includes $705,684 on account of equipment allocated and purchased and additions and betterments.
†Difference between tentative standard return taken into account and standard return as finally certified January 1, 1918 to December 31, 1919.
‡Includes interest on cumulative adjustment bonds and on income bonds.

The annual report of the St. Louis-San Francisco will be reviewed editorially in an early issue.

ST. LOUIS-SAN FRANCISCO.—*Asks Authority to Sell or Pledge Bonds.*—This company has been authorized by the Interstate Commerce Commission to sell all or any part of $4,232,000 of prior lien mortgage bonds now held in its treasury at not less than 90 per cent of par, or to pledge and repledge any part thereof from time to time as collateral security for short-term notes.

TENNESSEE, ALABAMA & GEORGIA.—*Special Master Appointed.*—D. L. Grayson has been appointed special master to assemble indebtedness of this road, which has been in the hands of receivers since December, 1920.

TENNESSEE CENTRAL.—*Sale ordered.*—Federal Judge E. T. Sanford has ordered this road sold on June 30 at Nashville, Tenn., for an upset price of not less than $2,000,000, with a cash payment of not less than $250,000. The court appointed A. Lyon Childress, of Nashville, as special master to conduct the sale. John H. Dewitt, of Nashville, was appointed to make a report on claims prior to first mortgage bonds. The receivers were directed to accept a loan of $30,000 from the Mississippi Valley Trust Company with which to pay arrear rentals due the Nashville Terminal Company to prevent forfeiture of the Tennessee Central's lease on the bridge across the Cumberland river at Nashville.

The receivers deny that the claim of the government for $650,000 advanced to the road during the war is just.

TENNESSEE CENTRAL.—*Auction.*—By decree of the Federal court at Chattanooga, Tenn., on May 22, this property, now in the hands of receivers, will be sold at public auction at Nashville, Tenn., on June 30.

UNION PACIFIC.—*Acquisition of Senator Clark's Holdings in Los Angeles & Salt Lake.*—The Union Pacific has purchased from Senator W. A. Clark and his friends the remaining half of the stock and bonds of the Los Angeles & Salt Lake Railroad. Judge Robert S. Lovett, chairman of the executive committee of the Union Pacific, made the following announcement on May 25 concerning the transaction:

The Union Pacific, which already owns through a subsidiary one-half the stock and bonds of the Los Angeles & Salt Lake Railroad Company, has reached an agreement with Senator Clark, who, with his friends, owns the other half, for the acquisition of his entire holdings. This gives the Union Pacific control of the property and assures the permanency of its position in southern California with its rails into Los Angeles and to the Pacific Ocean at San Pedro Harbor. The logical and natural destiny of the Los Angeles & Salt Lake ultimately as a railroad property is as a part of the Union Pacific System; and appreciation of this and not any differences led to the sale. It is a rather remarkable fact that during the 18 years of equal joint ownership and control by Senator Clark and ourselves absolutely no disagreements respecting policies, control or management have ever arisen between us. Our relations could not have been more co-operative and harmonious.

For the $29,000,000 of the 4 per cent bonds of the Los Angeles & Salt Lake held by Senator Clark and his friends (we already owning a like amount) we are giving in exchange dollar for dollar approximately $6,000,000 of the Southern Pacific's San Francisco Terminal 4 per cent bonds, $8,500,000 of the Southern Pacific Railroad First Refunding 4 per cent bonds and $14,500,000 of Oregon-Washington Railroad & Navigation First and Refunding 4 per cent bonds now in the Union Pacific treasury. The latter issue is guaranteed by the Union Pacific Railroad Company, and before they can be disposed of it is necessary to get permission of the Interstate Commerce Commission. Application for this will be made immediately and no objection is anticipated, but in the meantime, of course, the exchange of bonds will be delayed.

No change in the personnel of the staff operating the line or in their headquarters is contemplated, though, of course, the jurisdiction of our system general offices will be extended over the line and separate traffic agencies and other duplication of offices, if any, will be abolished.

In regard to the sale of his half-interest in the Los Angeles & Salt Lake to the Union Pacific, W. A. Clark said:

About twenty years ago R. C. Kerens, a prominent and distinguished western operator, called my attention to the Los Angeles Terminal Railroad Company, extending from Los Angeles to San Pedro harbor, and I and my brother, J. Ross Clark, joined him in the purchase of it, with the purpose of extending it to Salt Lake City.

Soon afterward E. H. Harriman at the head of the Union Pacific Railroad Company, which already had a line extending to the southern part of Utah, joined us in the scheme, and the line was constructed on a fifty-fifty basis, each party putting up the funds required until the road was completed. The capital stock and bonds were issued to cover expenditures and were divided equally between the Union Pacific Company and ourselves, but none of these securities by either party was ever placed on the market. All of the earnings have been applied to additions and betterments and extensions. In the near future the entire line will have been relayed with 90 lb. steel, which has been purchased and now partly laid, and the equipment, of the highest character, is ample and complete.

The advantage in the unification of the great Union Pacific Company's interest amply warrants them in the purchase of our holdings of the capital stock. In effecting this arrangement the interests of all bond and stockholders have been amply protected. In making the contract I have reserved for the benefit of the holders of any of the bonds not controlled by me the right to exchange them on the same terms as obtained for myself. In the severance of our relations as joint owners of this great property with the Union Pacific officials we extend to all of them personally and officially our most cordial wishes.

WABASH.—*New Director.*—C. G. Edgar, of Detroit, has been elected a director to succeed Guy E. Tripp, who has resigned his position as a director to comply with the provisions of the Clayton Act.

WESTERN PACIFIC.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue and sell at not less than 85 per cent of par and accrued interest, $4,180,000 of first mortgage 5 per cent gold bonds, due March 1, 1946, to be deposited with the trustees under the applicant's first mortgage and to be used only for capital expenditures specifically authorized. It was proposed to use the bonds for the purpose of acquiring bonds of the Sacramento Northern, but the commission's order provides that the applicant shall not expend any of the proceeds of the bonds for the purpose of acquiring the property of the Sacramento Northern or control thereof and shall not otherwise acquire the property or the control until the commission has approved such acquisition upon application duly made.

WILLIAMSPORT & NORTH BRANCH.—*Asks Authority to Issue Securities.*—This company has applied to the Interstate Commerce Commission for authority to issue $200,000 of bonds, $200,000 of 6 per cent preferred stock and $500,000 of common stock, to be delivered to four individuals in payment for the property of the railroad.

Guaranty Certificates Issued

The Interstate Commerce Commission has certified to the Treasury Department that the following amounts are due various carriers as partial payments on account of the six months' guaranty: Chicago & North Western, $800,000; Michigan Central, $260,000; Nez Perce & Idaho, $6,000; Peoria & Pekin Union, $55,000; Louisville Bridge & Terminal, $150,000; Peoria Railway Terminal, $87,000; Mount Hope Terminal, $4,000; Maryland & Pennsylvania, $15,000; Frankfort & Cincinnati, $12,500; Detroit & Mackinac, $50,000; Leavenworth Terminal, $18,000.

Dividends Declared

Mobile & Birmingham.—Preferred, 2 per cent, semi-annually, payable July 1 to holders of record June 2 to June 30.

Pittsburgh, Youngstown & Ashtabula.—Preferred, 1¼ per cent, quarterly, payable June 1 to holders of record May 20.

Reading Company.—2nd preferred, 1 per cent, quarterly, payable July 14 to holders of record June 27.

Annual Report

Buffalo, Rochester & Pittsburgh Thirty-Sixth Annual Report

The Directors of the Buffalo, Rochester and Pittsburgh Railway Company submit to the Stockholders the following report for the year ending December 31, 1920.

U. S. R. R. ADMINISTRATION.

As stated in last year's report, in accordance with a proclamation of the President of the United States issued under date of December 24th, 1919, and with the terms of the Transportation Act of 1920, Government control of railroads was terminated at 12.01 a. m. on March 1st, 1920.

A final settlement was effected on December 4, 1920, in full satisfaction of all the accounts in favor of and against the United States Railroad Administration.

GUARANTY PERIOD.

The Transportation Act of 1920 above referred to, among other things contains Section No. 209 guaranteeing to any carrier which accepts it, a return for the six months immediately following Federal Control of not less than one-half the amount named in the contract with the Director General of Railroads as annual compensation, provided a written statement is filed with the Interstate Commerce Commission accepting all the provisions of the Section, on or before March 15, 1920. As stated in last year's report, such an acceptance was authorized by your Board of Directors and duly filed on March 8, 1920.

The Section also provided for partial payments of the guaranteed amount, under certain conditions, upon applications made during the Guaranty Period.

Under this authority the Secretary of the Treasury from time to time advance to your company funds to meet fixed charges and operating expenses.

The completed statement of account with the Interstate Commerce Commission has been filed, and the final settlement for the guaranty period will be progressed as rapidly as possible.

In accordance with the precedent established in the last two years, the full details of the operations under Federal Control for the first two months of this year, the subsequent six months of the Guaranty Period, the four months of corporate control, and the comparative combined results for the year are given in an appendix to this report.

ROAD.

	1920.	1919.	Dec.
Owned	368.31	368.31	
Leased	90.30	90.30	
Trackage rights	131.11	131.11	
Total length of road operated	589.72	589.72	
Second track	212.59	212.59	
Sidings	455.13	456.21	1.08
Total miles of all tracks, all steel rails	1,257.44	1,258.52	1.08

INCOME.

	1920	1919.	Increase or Decrease.
Operating Income:			
Revenues	$9,145,766.08	.....	$9,145,766.08
Expenses	7,126,122.02	$91,544.84	7,034,577.18
Net revenue	$2,019,644.06	(Def.) $91,544.84	$2,111,188.90
Tax accruals	507,000.00	99,108.52	407,891.48
Uncollectible revenues	46.63	.....	46.63
	$507,046.63	$99,108.52	$407,938.11
Total operating income	$1,512,597.43	(Def.) $190,653.36	$1,703,250.79
Non-Operating Income:			
Rental—U. S. R. R. Admin.	557,935.43	3,276,410.42	—$2,718,474.99
Rental—Guaranty Period	1,759,612.97	.....	1,759,612.97
Other items	731,439.71	385,222.30	346,217.41
	$3,048,988.11	$3,661,632.72	—$612,641.61
Gross income	$4,561,585.54	$3,470,979.36	$1,090,606.18
Deductions:			
Rentals of leased lines, interest, etc.	$2,235,825.18	$2,407,012.07	—$171,186.89
Net income	$2,325,760.36	$1,063,967.29	$1,261,793.07
Appropriations:			
Pension and Fire Insurance Funds	30,710.95	28,601.63	2,109.32
Surplus available for dividends	$2,295,049.41	$1,035,365.66	$1,259,683.75
Return on capital stock	13.91%	6.27%	7.64%

The increase of $407,891.48 in tax accruals is chiefly due to the income and excess profit tax.

On account of the irregular periods and conditions affecting the operations of this year, no further analysis is made of the comparative results with the preceding year.

DIVIDENDS.

Dividends in cash were paid on:			1920		1919
Preferred Stock	$6,000,000	6%	$360,000	6%	$360,000
Common Stock	10,500,000	4%	420,000	4%	420,000
Total	$16,500,000		$780,000		$780,000

Since the close of the fiscal year, your Board of Directors has declared semi-annual dividends of three per cent. on the preferred stock and three per cent. on the common stock, payable February 15, 1921.

CAPITAL STOCK.

There has been no change during the year in this account. The total outstanding Capital Stock of the Company amounts to $16.500,000, and consists of $6,000,000 preferred stock and of $10,500,000 common stock.

FUNDED DEBT.

In accordance with the provisions of the Consolidated Mortgage of 1907, the Trustee delivered to the Company $1,059,000 4½% Bonds, representing the entire issue of Equipment Bonds, Series B, amounting to $1,000,000, and 50% of Equipment Bonds Series E retired during the year.

These bonds, added to those in the Treasury of the Company, make a total of $4,081,000 held in reserve.

To provide for the rolling stock allocated by the United States Railroad Administration and nominally delivered to your Company in 1918, an issue of $2,004,000 six per cent Equipment Gold Notes was authorized, secured by 800 fifty-five ton capacity steel coal cars, costing a minimum sum of $2,004,000. The final cost figures, still under determination by the Government, will slightly exceed this minimum.

These notes were issued under an Agreement with the Director General of Railroads, known as "Equipment Trust No. 10" dated January 15, 1920, and were all taken by the Government at par. They mature in annual installments of $133,600.00, commencing January 15, 1921, and ending January 15, 1935.

Bonds issued during the year:			
Equipment 6% Gold Notes			$2,004,000
Bonds retired during the year:			
Series B (Balance of issue)		$892,000	
" C		66,000	
" E		119,000	
" F		181,000	
" G		184,000	
" H		125,000	
" J		100,000	
" K		80,000	
Rochester & Pittsburgh Railroad Co. First Mortgage 6% Bonds		15,000	
		$1,762,000	
Less reduction of amount of bonds held in funds		102,000	1,660,000
Net increase in bonded debt of the Company held by the public on December 31, 1920			$344,000

LOANS.

The floating debt of the Company was extinguished during the year by the payment of the outstanding notes, amounting to $1,865,000.00.

COST OF ROAD.

Capital account has been charged during the year with $407,640.22 for investment in road, as follows:

Terminal facilities, Buffalo Creek, N. Y.	$67,833.21
Roadway machines	13,265.82
Highway bridge, C. & M. Junction, Pa.	17,717.78
Subway, Brown St., Rochester, N. Y.	17,320.74
Increased weight of rail, etc.	154,318.37
Stone and slag ballast	71,994.93
Additional sidings, yard extensions, etc.	65,189.37
Total	$407,640.22

The terminal improvements at Buffalo, N. Y., referred to in last year's report, are completed.

The work on the subway, Brown St., Rochester, N. Y., undertaken jointly by the City, the New York Central Railroad Company and your Company, is now in progress and will be finished this coming year.

The general program of strengthening the road with stone ballast and heavier type of rail was continued.

COST OF EQUIPMENT.

Expenditures were made for additions to equipment as follows:

Sundry locomotive betterments	$20,262.46
Eight hundred steel gondola cars, purchased per allocation of U. S. R. R. Administration	2,004,000.00
Four gondola cars purchased	2,180.30
Four work equipment cars purchased	1,832.19
Sundry car betterments	11,906.65
	$2,040,181.60

There was credited for equipment sold, transferred or destroyed, the following book values, on which the accrued depreciation to January 1, 1918, and subsequent to February 29, 1920, was charged to Accrued Depreciation Account, and the balance to the U. S. R. R. Administration:

Twenty-four locomotives	$300,608.94	
Four hundred and ninety-six freight train cars	387,543.06	
Seven work equipment cars	2,091.18	
Three miscellaneous equipment cars	1,424.47	691,667.65
Making a net increase of		$1,348,513.95

The use of heavy modern power purchased in recent years enabled us to spare twenty-one of the lighter type locomotives, which were sold at favorable prices. Also, owing to the high cost of repairs, three hundred and six gondola cars were disposed of at market values. The rolling stock statistics are affected as follows:

The total tractive power of engines aggregates 14,281,845 pounds, a decrease of 1,064,985 pounds during the past year.

The average tractive power of each engine increased 1,530 pounds, being 45,630 pounds as against 44,100 pounds on December 31, 1919.

The total carrying capacity of cars in freight service now amounts to 748,215 net tons, a decrease of 23,326.

The average carrying capacity or efficiency of each freight car increased .15 ton, being 44.12 tons as against 43.97 tons.

Of the cars in passenger service, 47.31 per cent are of steel construction; and in the freight service 94.60 per cent of the cars are all-steel, or are equipped with steel underframes.

FIRE INSURANCE FUND.

The assets of this fund were increased $42.116.30 and now amount to $429,805.53 in interest bearing securities and cash.

PENSION FUND.

The assets of this fund, created July 1, 1903, were increased $4,677.57, and now amount to $257,375.30 in interest bearing securities and cash.

There were 80 pensioners upon the roll on December 31, 1920, a net increase of 8 during the year.

GENERAL REMARKS.

The increased rates for the transportation of mail, fixed by the Interstate Commerce Commission, became effective November 1, 1916, when the space basis was put into operation. The back amount for the period prior to Federal Control, amounting to $23,008.07, was credited to Profit and Loss Account.

A new agreement uniform in its application over all rail lines was made with the American Railway Express Company, effective on September 1, 1920, for a period of five years, and to continue thereafter until a four months' notice in writing is given by either party.

The valuation of your lines by the Interstate Commerce Commission began July 1, 1917, and is about 80% completed. The amount expended to date on this account has reached $161,299.44.

The officers in charge of the operations of the road prior to Federal Control, were reinstated on March 1, 1920, the date on which the corporation resumed its active management.

The acknowledgments of the Board are renewed to its officers and employes for their faithful and efficient service.

By order of the Board,

WILLIAM T. NOONAN, President.

Rochester, N. Y.
March 7, 1921.

PROFIT AND LOSS ACCOUNT.

December 31, 1920.

CREDIT.		
Balance Surplus December 31, 1919		$3,895,785.30
Credit Balance, transferred from Income Account (page 19)		2,295,049.41
Delayed income credits—		
Adjustment of investment accounts authorized by Interstate Commerce Commission	$17,168.27	
Back mail pay	23,008.07	40,176.34
Unrefundable overcharges		6,812.67
Donations		48.00
MISCELLANEOUS CREDITS—		
Discount on funded debt retired	$11,348.75	
Profit on material sold	31,841.83	
Unclaimed wages, etc	7,011.54	
Sundry items	9,286.96	59,489.08
Total		$6,297,360.80
DEBIT.		
Dividend appropriation of surplus—		
Preferred stock—		
(No. 53) 3% on $6,000,000, payable February 15, 1920	$180,000.00	
(No. 54) 3% on $6,000,000, payable August 15, 1920	180,000,000	
Common stock—		
(No. 40) 2% on $10,500,000, payable February 15, 1920	210,000.00	
(No. 41) 2% on $10,500,000, payable August 15, 1920	210,000.00	
	$780,000.00	
Surplus appropriated for investment in physical property	4,010.94	
Debt discount extinguished through surplus	2,587.00	
Loss on retired road and equipment	70,001.75	
Miscellaneous debits—sundry items	6,218.44	862,818.13
Balance Surplus December 31, 1920 (page 11)		$5,434,542.67

COMPARATIVE GENERAL BALANCE SHEET.

ASSETS		DECEMBER 31, 1920.	
INVESTMENTS.			
Investment in road (page 15)		$36,881,955.12	
Investment in equipment (page 16)		24,498,774.05	
General expenditures (page 15)		16,825.85	
			$61,397,555.02
Improvements on leased railway property (page 14):			
Allegheny & Western Railway Co.		$313,892.05	
Clearfield & Mahoning Railway Company		283,117.57	
		$597,009.62	
Credit			
Mahoning Valley Railroad Company		180,707.59	
			416,302.03
Sinking Funds—Equipment Agreements			2,497.96
Deposits in lieu of mortgaged property sold			
Miscellaneous physical property		$8,531.27	
Investments in affiliated companies (page 13):			
Stocks		363,107.54	
Bonds		295,000.00	
Advances		331,000.00	
			989,107.54
Other investments (page 13):			
Stocks		$100.00	
Liberty Loan Bonds		6,050.00	
U. S. Certificates		368,276.89	
Mortgage—Real Estate		990.00	
			375,416.89
Total investments			$63,189,410.71
CURRENT ASSETS.			
Cash		$447,713.31	
Demand loans and deposits		1,809,912.48	
Special deposits		12,617.50	
Loans and bills receivable		5,108.80	
Traffic and car-service balances receivable		1,363,538.93	
Net balance receivable from agents and conductors		153,573.95	
Miscellaneous accounts receivable		736,673.97	
Material and supplies		2,577,735.23	
Interest and dividends receivable		11,092.62	
Rents receivable		66,976.01	
U. S. R. R. Adm.—Rental			
Total current assets			7,184,942.80
DEFERRED ASSETS.			
Working fund advances		$10,947.00	
Insurance and other funds:			
Fire insurance fund (page 22)	$429,805.53		
Pension fund (page 23)	257,375.30		
New York State Industrial Commission	28,481.25		
	$715,662.08		
Less—Buffalo, Rochester & Pittsburgh Ry. Co. obligations	27,000.00		
		688,662.08	
Other deferred assets		1,373.82	
Total deferred assets			700,982.90
UNADJUSTED DEBITS.			
Rents and insurance premiums paid in advance		$2,570.02	
Other unadjusted debits		825,955.15	
Total unadjusted debits			828,525.17
Securities issued			
Mortgage bonds—consolidated mortgage B. R. & P. Ry.			
Unpledged held in treasury	$4,081,000.00		
GRAND TOTAL			$71,903,861.58

LIABILITIES.		DECEMBER 31, 1920.	
CAPITAL STOCK—Common		$10,500,000.00	
Preferred		6,000,000.00	
Total Stock			$16,500,000.00
LONG-TERM DEBT (page 28)			
Funded Debt Unmatured:			
Mortgage bonds—First mortgage, R. & P. R. R.		$1,285,000.00	
Consolidated mortgage, R. & P. R. R.		3,920,000.00	
General mortgage, B., R. & P. Ry.		4,427,000.00	
Consolidated mortgage, B., R. & P. Ry.	$18,210,000.00		
Less—Held in Treasury	4,081,000.00		
		14,129,000.00	
First mortgage, L., P. & C. R. R.		350,000.00	
Equipment trust obligations	$8,990,000.00		
Less—Held in funds	27,000.00		
		8,963,000.00	
Non-negotiable debt to affiliated companies:			
Avonmore & Northern R. R.		7,610.21	
			33,081,610.21
CURRENT LIABILITIES.			
Loans and bills payable		$9,600.00	
Traffic and car service balances payable		397,538.44	
Audited accounts and wages payable		1,519,742.87	
Miscellaneous accounts payable		1,438.77	
Interest matured unpaid		12,397.50	
Funded debt matured unpaid		1,000.00	
Unmatured interest accrued		360,849.87	
Unmatured rents accrued		67,533.73	
Total current liabilities			2,370,101.18
DEFERRED LIABILITIES			
Other deferred liabilities		$16,823.09	
Total deferred liabilities			16,823.09
UNADJUSTED CREDITS.			
Tax liability		$502,104.35	
Premium on funded debt		6,079.71	
Insurance and casualty reserves		429,763.87	
Accrued depreciation—Road (page 20)		383,303.23	
Accrued depreciation—Equipment (page 20)		5,221,660.71	
Other unadjusted credits—			
Accrued depreciation—Leased equipment:			
Allegheny & Western Ry. Co. (page 21)	$236,102.47		
Clearfield & Mahoning Ry. Co. (page 21)	35,849.99		
Mahoning Valley R. R. Co. (page 21)	2,290.18		
Other items	2,722,107.78		
		2,996,350.42	
Total unadjusted credits			9,539,262.29
CORPORATE SURPLUS.			
Additions to property through income and surplus:			
Road	$7,842.17		
Equipment	908,053.06		
Long term debt retired.			
Equipment trust obligations	3,788,251.61		
		$4,704,146.84	
Miscellaneous fund reserves		257,375.30	
Total appropriated surplus		$4,961,522.14	
Profit and loss (page 12)		5,434,542.67	
Total corporate surplus			10,396,064.81
GRAND TOTAL			$71,903,861.58

NOTE.—For contingent liabilities representing bonds of leased lines, the payment of principal and interest of which is guaranteed by the Buffalo, Rochester and Pittsburgh Railway Company, see page 29 of report.

[ADV.]

Railway Officers

Financial, Legal and Accounting

R. A. McNaughton has been appointed general accountant of the Lake Erie & Northern with headquarters at Galt, Ont., effective May 5, succeeding A. McL. Campbell, transferred.

William A. Northcutt, whose promotion to general solicitor of the Louisville & Nashville, with headquarters at Louisville, Ky., was announced in the *Railway Age* of May 20 (page 1195), was born in Grant County, Ky., on February 5, 1876. He was educated in the public and private schools of Williamstown, Ky., and in the law department of the University of Louisville. He entered railroad service on October 11, 1900, as a stenographer in the law department of the Louisville & Nashville, and has served that company continuously since then. In 1902, he was made chief clerk in the law department, and served in that position until 1910, when he was promoted to commerce attorney, with headquarters at Louisville. In 1918, when Federal control went into effect, Mr. Northcutt was promoted to general attorney. His promotion was confirmed in March, 1920, following the return of the roads to private management, and he was serving in that position at the time of his recent promotion.

W. A. Northcutt

Operating

J. M. Doyle, assistant general superintendent of the Great Northern, with headquarters at Everett, Wash., has been appointed superintendent of the Spokane and Marcus divisions, with headquarters at Spokane, Wash., effective May 20.

B. W. Proctor, assistant to the general manager of the International & Great Northern, with headquarters at Palestine, Tex., has been promoted to assistant general manager, with the same headquarters, succeeding **E. G. Goforth,** whose promotion to general manager was announced in the *Railway Age* of May 13 (page 1149).

Traffic

J. D. Noriega has been appointed Mexican traffic representative of the Missouri, Kansas & Texas, with headquarters at Mexico City.

Engineering, Maintenance of Way and Signaling

Col. C. N. Monsarrat has been appointed consulting engineer of bridges of the Canadian National with headquarters at Toronto, effective May 1.

P. G. Lang, Jr., assistant engineer of bridges of the Baltimore & Ohio, with headquarters at Baltimore, Md., has been promoted to engineer of bridges, succeeding W. S. Bouton, who has retired on account of ill health.

I. H. Schram, superintendent terminals of the Erie, with headquarters at Marion, Ohio, has been appointed division engineer, with the same headquarters, succeeding H. S. Elliott, who has resigned. The position of superintendent of terminals at Marion has been abolished.

F. L. Wheaton, division engineer of the Delaware, Lackawanna & Western with headquarters at Binghamton, N. Y., has been transferred to Buffalo, succeeding G. E. Boyd. Mr. Wheaton will have jurisdiction over both the Buffalo and the Scranton divisions, the office of division engineer at Binghamton having been abolished.

Purchasing and Stores

W. J. Sidey, general storekeeper of the Buffalo, Rochester & Pittsburgh, has been assigned other duties and the position of general storekeeper has been abolished, effective May 20. Officers and employees heretofore reporting to the general storekeeper will report to the chief engineer.

Obituary

Henry B. Ledyard, chairman of the board of directors and former president of the Michigan Central, died in his home in Detroit on May 25.

E. C. D. Marshall, general freight and passenger agent of the Louisiana Railway & Navigation, with headquarters at Shreveport, La., died at Baltimore, Md., on May 10.

Edward L. Brown, former president of the Minneapolis & St. Louis and the Denver & Rio Grande, died at St. Paul, Minn. on May 22, after an illness of several months. He was born at Pella, Iowa, in 1864, and entered railroad service in 1875, as a messenger on the Chicago, Rock Island & Pacific. From 1877 to 1890, he served successively as telegraph operator, station agent, and train dispatcher on the Rock Island. In 1883, in addition to his other duties he was made joint agent of the Rock Island and the Wabash & Iowa Central. In August, 1890, he was appointed general agent of the St. Paul & Duluth, with headquarters at West Superior, Wis., and in April, 1891, he was transferred to St. Paul, Minn. In December of the same year, he was appointed master of transportation, being promoted to superintendent in March, 1896. In June, 1900, he left the St. Paul & Duluth to become superintendent of the Lake Superior division of the Northern Pacific, with headquarters at Duluth, Minn. From February, 1902 to April, 1903, he served as general superintendent of the Montana Central, and on the latter date was appointed general superintendent of the Eastern district of the Great Northern. In October, 1907, he was transferred to the Western district, with headquarters at Seattle and Tacoma, Wash., serving in this position until February, 1912, when he was elected vice-president of the Denver & Rio Grande. In July, 1913, he was elected vice-president of the Western Pacific in addition to his duties with the Denver & Rio Grande, but resigned in September, 1916, to accept the presidency of the Minneapolis & St. Louis. He was compelled to give up this position in March, 1917, on account of ill-health. In October, 1917, Mr. Brown was elected president of the Denver & Rio Grande, and at the advent of federal control, was appointed federal manager of that road. He resigned on account of ill-health in November, 1918. During the latter part of federal control, Mr. Brown served as assistant to the regional director of the Southwestern region, with headquarters at Dallas, Tex. He was not engaged in active railroad service at the time of his death.

E. L. Brown